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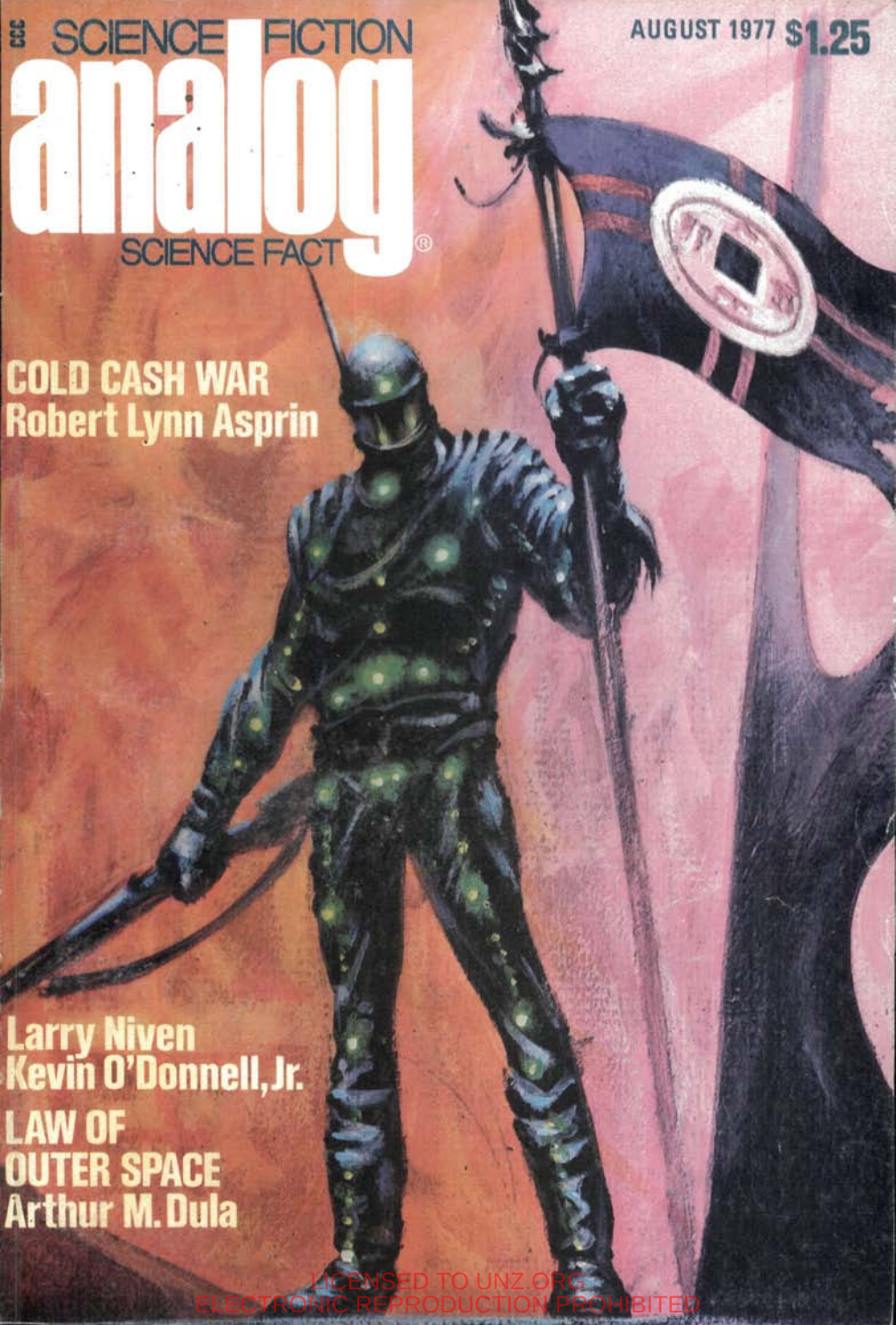

COLD CASH WAR
Robert Lynn Asprin

Larry Niven
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LAW OF
OUTER SPACE
Arthur M. Dula

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Late last year, Metagaming tried an experiment...a small, inexpensive game designed for a playing time of an hour. If it went over, it would be the prototype of a new line — the MicroGames. It was called OGRE.

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So you'll be seeing a lot of MicroGames. And we think you'll like them. For $2.95 (or $2.50, if you subscribe to *The Space Gamer*), you'll get a nice set of components and a well-organized and *thoroughly* playtested set of rules. (We playtest these a *lot*. It's fun.) And the whole package is a game you can learn quickly and play quickly. Any time. On your lunch hour, between classes, after work. Or whatever.

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A lot of people are having fun with the MicroGames. Try one. You'll be surprised what a $2.95 quickie can do for you.

MicroGame #2...

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THE HARVEST WARS

Chitin is a tactical combat game based on Metagaming's upcoming society-level game, *Hymenoptera*. In *Hymenoptera*, hives of intelligent insects war among themselves for space and food, using their biotechnology to breed ever more fearsome types of warriors. *Chitin* shows what happens when two small hives clash.

In *Chitin*, the objective is to have your workers bring back the Harvest Chits scattered across the board. The problem, of course, is that your enemy wants them too. In the learning scenario, each hive has four types of fighters, each with its own strengths and weaknesses. Advanced games add ever-increasing numbers of units, flying and command types – and allow points for bringing back not only food but also the bodies of enemy (or friendly) units. The Hive must eat...

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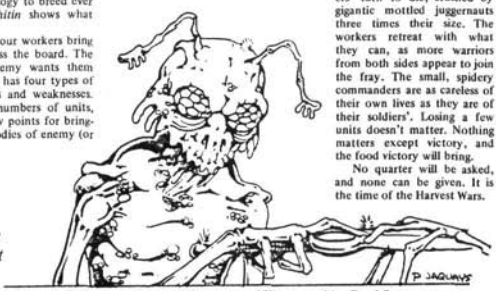

Call it summer. There are seven seasons on this world, but now is the time of harvest. The dun-colored workers leave the hive, moving into the valleys to gather the crops.

But other hives want those crops, too. A horde of gleaming fighters – spiked travesties of the busy workers – tears into their midst, killing as viciously and efficiently as the insects they are. Then, incredibly quickly, comes the attackers' turn to die, crushed by gigantic mottled juggernauts three times their size. The workers retreat with what they can, as more warriors from both sides appear to join the fray. The small, spidery commanders are as careless of their own lives as they are of their soldiers'. Losing a few units doesn't matter. Nothing matters except victory, and the food victory will bring.

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Game design by Howard Thompson / Illustrated by Paul Jaquays

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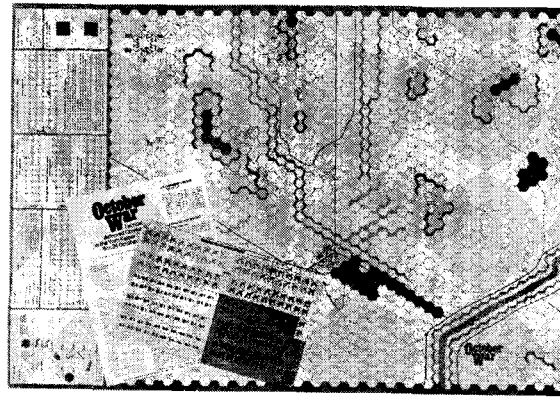

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Editorial Assistant
HERBERT S. STOLTZ
Art Director
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editorial

as you go

If there is a malaise in American society, its major symptoms seem to be a feeling that "I'm not getting as much out of the system as I'm putting into it," combined with the feeling that "other people are living off my taxes without working."

Anyone who has faithfully paid health insurance premiums for years and then found that the particular illness that's laid him low isn't covered by his insurance plan knows that first feeling. People who pay steadily increasing taxes year after year and then see in their newspapers that some very wealthy individuals pay no personal income taxes at all know the second feeling. And you can get both feelings simultaneously at the supermarket, when the price of coffee doubles every time you take a peek and you know that it's not the impoverished pickers in Brazil who are raking in the profits.

Many Americans are also disgruntled with the welfare system and believe that there are huge numbers of able-bodied men and women on welfare or unemployment insurance who should be—and could be—working and paying taxes.

Other factors contribute to this feeling. CBS-TV recently showed on *60 Minutes* how some Air Traffic Controllers have retired at 75% of their gross annual pay after only a few years of work, thanks to a friendly doctor who certified that they were hypertense, potential heart attack victims, or ready for nervous breakdowns. Their retirement income, by the way, is tax free. These are men in their thirties and forties, retired on our tax money, taking other jobs illegally (the Labor Department doesn't have the staff to check on them) and talking about it on national television.

No magic stroke of government or public arousal is going to solve these problems overnight. But since we are science fiction enthusiasts we can examine what might happen if some

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radical change in our social and governmental systems were instituted in the near future.

For example: why not abolish taxes?

Taxes are a method by which governments raise the money to pay for their operations. Presumably, these operations are for the benefit of the taxpayers. But many people feel that their various local, state, and national governmental agencies are not working for their benefit.

Taxation has been going on for as long as there have been governments. George Bernard Shaw, no slouch at observing the human condition, had Julius Caesar say in his play, "Caesar and Cleopatra," that collecting taxes is the main business of government.

The American Revolution was fought largely as a protest against unjust, arbitrary, and burdensome taxes. But the tax load on the average American in 1776 was a pittance compared to the taxes the average American citizen pays today.

So why not abolish taxes completely? Just because governments have always raised their operating revenues through taxes is no reason to believe, or desire, that they will always continue to do so.

(Brief aside to the economists: Yes, I know that most government operations are actually financed by loans from banks and/or currency manipulations by the treasury. But these financing deals cannot go on if the government does not pay them back out of revenues collected from taxpayers. *Vide* New York City.)

How can we exist in a society as complex as our own without taxes? How can we pay for police protection, health insurance, social security, the Armed Services, postal delivery, schools, libraries, courts, building inspectors, legislators' salaries, *et* a few million *ceteras*?

Simple. Pay as you go.

If you earn a regular salary the federal, state, and local governments extract their tax payments from your every paycheck. They demand that you pay your taxes as you go through the year, paycheck by paycheck, rather than paying in quarterly or annual lump sums.

So why can't we extend this "pay as you go" philosophy to all phases of government and social operations, and thereby put an end to taxation?

In Mexico and many other exotic places (including middling wealthy neighborhoods of New York City) the residents of some city blocks hire their own policemen who patrol that block and only that block. If the residents are unhappy with the guard they have hired—if, for example, there are burglaries on the block—the guard is fired and a new man hired. It's quite simple and very effective. Very little paperwork or bureaucracy.

How would we pay for a central detective bureau, the files and laboratory experts of the police department, the courts and other centralized paraphernalia of a modern criminal justice system? Let the crooks pay! Set the fines for nonviolent crimes equivalent

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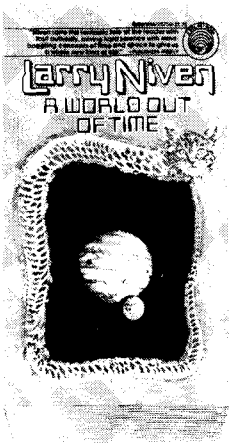

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to the cost (including overhead) of catching the miscreants. Thus, if you embezzle money from your employer and give yourself up, your punishment would be less than if the police had to expend many manhours of effort to catch and convict you. The punishment should fit the crime, after all.

There will still be a large burden of overhead costs to pay. These could be assessed per capita, based on the conviction rate of the police department, and paid on a voluntary basis. There is no reason why a poor police force, with a large percentage of unsolved crimes, should be paid as well as a good police force. Your annual bill for police protection should be pegged to the number of crooks the police successfully put behind bars.

Same for judges.

This would certainly lead the police and the courts to equate the number of people in jail with their own salaries. It could lead to railroading innocent people. But as soon as that starts happening, those innocent people's families and friends are going to raise a howl. And that howl will be *directly* related to the number of people who voluntarily pay the salaries of the cops and justices. It could be a self-correcting system.

What about poor people? Those who can't afford to pay for police protection won't get any and thus will be prime stock for filling the jails and keeping the conviction score high. True enough.

But under the pay-as-you-go system, welfare recipients and the unemployed could be hired by the government to do necessary jobs that can earn them an income. A welfare mother's job should be, at the very least, to see that her children attend school and pass their classes. If the children flunk or are truant, it should affect their mother's income.

Unemployed men and women who are not encumbered by school-age children can work in their own neighborhoods at the hundreds of cleaning, rebuilding, and refurbishing jobs that now go begging. They could patrol school corridors to prevent student violence. They could handle a myriad of other tasks that no one takes on now because there is no social mechanism for assigning and rewarding such work. In a society where bright students study computer programming, we have a dearth of carpenters, shoemakers, and other craft-oriented specialists.

Where would the income for such jobs come from? If there are no welfare taxes, no enforced payment, then these jobs must be paid for either by directly billing the people who use the services or by voluntary contributions from those who have the money to give. Personal charity. This is admittedly a weak link in our scheme, because while many grumbling taxpayers claim they would prefer to make voluntary charitable contributions than to have welfare taxes pried out of their paychecks, there is a strong suspicion that voluntary charity would not cover all the needs of the welfare recipients.

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However, each citizen of the community could be given a welfare bill regularly—say, every three months. The size of the bill will tell the citizens how well the welfare system is working. The smaller the bill, the fewer people are on the public dole. If the bill gets bigger, it's time to find out what's going wrong and to fix it.

And so on down the line.

Teachers' salaries should be keyed to the performance of their students on impartial national tests. The job of a teacher is to impart knowledge to students. If the students do not learn enough in a teacher's class to pass a standard test on that subject, then the teacher is not earning his or her salary, as far as that student is concerned.

Parents should pay for their children's schooling, on an individual basis with individual decisions on elective classes and extracurricular activities, all handled strictly on a pay-as-you-go basis. The rich will get better schooling than the poor? Of course! They always do. But the poor will have firmer control—and *responsibility*—over their children's schooling.

Citizens who have no children in the school system should get an annual bill for the community's educational needs. They can pay this bill voluntarily, on the assumption that the better the schools are the better the community is, or they can ignore the school bill and watch their community sink.

This is the crux of the pay-as-you-go idea. Responsibility. It is really a mammoth, nationwide "honor system," in which the individual citizen accepts the responsibility for paying—and controlling—all the governmental operations that we now take for granted and pay for automatically through taxation.

Can a society exist on such a voluntary basis? Probably not. We have the computer technology to handle individual billings for various governmental and social services. But we don't seem to have the mental attitude that would permit us to part with money in return for maintaining—or building—a strong, healthy, happy community.

Perhaps this is the real disease behind the symptoms we mentioned at the beginning of this Editorial, the attitude that, "I've got mine, the rest of you can go to hell for all I care."

We are mammals. We are social mammals. We are as interdependent as a tribe of baboons or a pride of lions. Yet when it comes to money we seem to think that whatever we can get our hands on is *ours* and nobody else deserves a share.

Well, maybe we could institute a pay-as-you-go system in a few key places here and there in our society and see how it works. I would love to see how it would affect the Postal Service. Pay for a letter on the basis of how much it cost to actually carry it to its destination—minus a penalty for every day it took to get there.

Heaven.

THE EDITOR

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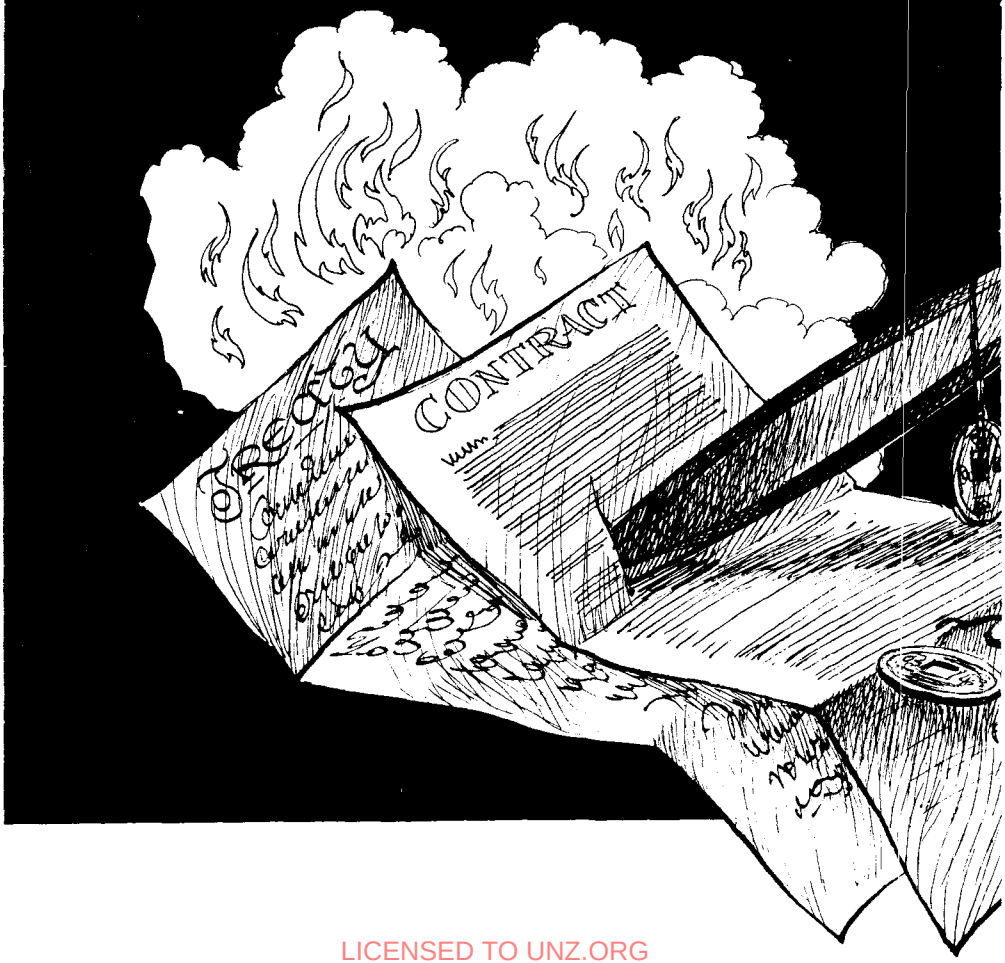
Cold Cash War

Military strategies and tactics change constantly. But when the nature of the combatants changes, the nature of war itself is altered.

Robert Lynn Asprin



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Kelly Freas

The sound of automatic weapons fire was clearly audible in the Brazilian night as Major Tidwell silently crawled the length of the shadow, taking pains to keep his elbows close to his body. Tree shadows were only so wide. He probed ahead with his left hand until he found the fist-sized rock with the three sharp corners which he had gauged as his landmark.

Once it was located, he sprang the straps on the Jump Pad he had been carrying over his shoulder and eased it into position. With the care of a professional he double-checked its alignment; front edge touching the rock and lying at a 45° angle to an imaginary line running from the rock to the large tree on his left, flat on the ground, no wrinkles or lumps.

Check.

This done, he allowed himself the luxury of taking a moment to try to see the Scanner Fence. Nothing. He shook his head with grudging admiration. If it hadn't been scouted and confirmed in advance he would never have known there was a "fence" in front of him. The Set Posts were camouflaged to the point where he couldn't spot them even knowing what he was looking for, and there were no tell-tale light beams penetrating the dark of the night. Yet he knew that just in front of him was a maze of relay beams which, if interrupted, would trigger over a dozen automount weapons and direct their fire into a ten-meter square area centering on the point the beams were interrupted. An extremely effective trap as

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well as a foolproof security system, but it was only five meters high.

He smiled to himself. Those cost accountants will do it to you every time. Why build a fence eight meters high if you can get by with one five meters high? The question was, could they get by with a five meter fence?

Well, now was as good a time as any to find out. He checked the straps of his small back pack to be sure there was no slack. Satisfied there was no play to throw him off balance, his hand moved to his throat mike.

"Lieutenant Decker!"

"Here, Sir!" The voice of his first lieutenant was soft in the earphone. It would be easy to forget that he was actually over 500 meters away leading the attack on the south side of the compound. Nice about fighting for the Itt-iots, your communications were second to none.

"I'm in position now. Start the diversion."

"Yes, sir!"

He rose slowly to a low crouch and backed away from the pad several steps in a duck walk. The tiny luminous dots on the corners of the Jump Pad marked its location for him exactly.

Suddenly, the distant firing doubled in intensity as the diversionary frontal attack began. He waited several heartbeats for any guard's attention to be drawn to the distant fight, then rose to his full height, took one long stride and jumped on the pad hard with both feet.

The pad recoiled from the impact of his weight kicking him silently upward. As he reached the apex of his flight, he tucked and somersaulted like a diver, extending his legs again to drop feet first, but it was still a long way down. His forward momentum was lost by the time he hit the ground and the impact forced him to his knees as he tried to absorb the shock. He fought for a moment to keep his balance, lost it and fell heavily on his back.

"Damn!" He quickly rolled over onto all fours and scuttled crabwise forward to crouch in the deep shadow next to the Auto-Gun turret. Silently he waited, not moving a muscle, eyes probing the darkness.

He had cleared the "fence". If he hadn't he would be dead by now. But if there were any guards left the sound of his fall would have alerted them. There hadn't been much noise, but it didn't take much. These Oil Slickers were good. Then again there were the explosives in his pack.

Tidwell grimaced as he scanned the shadows. He didn't like explosives no matter how much he worked with them. Even though he knew they were insensitive to impact and could only be detonated by the radio control unit carried by his lieutenant, he didn't relish the possibility of having to duplicate that fall if challenged.

Finally his diligence was rewarded . . . a small flicker of movement by the third hut. Moving slowly, the major loosened the strap on his pistol. His gamble of carrying the extra bulk of a silenced weapon was about to pay

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off. Drawing the weapon, he eased it forward and settled the luminous sights in the vicinity of the movement, waiting for a second tip-off to fix the guard's location.

Suddenly, he holstered the weapon and drew his knife instead. If there was one, there would be two, and the sound of his shot, however muffled, would tip the second guard to sound the alarm. He'd just have to do this the hard way.

He had the guard spotted now, moving silently from hut to hut. There was a pattern to his search, and that pattern would kill him. Squat and check shadows beside the hut, move, check window, move, check window, move, hesitate, step into alley between the huts with rifle at ready, hesitate three beats to check shadows in alley, move, squat and check side shadows, move . . .

Apparently the guard thought the intruder, if he existed, would be moving deeper into the compound and was hoping to come to him silently from behind. The only trouble was the intruder was behind him.

Tidwell smiled. Come on, sonny! Just a few more steps. Silently he drew his legs under him and waited. The guard had reached the hut even with the turret he was crouched behind. Squat, move, check window, move, check window, move, hesitate, step into alley . . .

He moved forward in a soft glide. For three heartbeats the guard was stationary, peering into the shadows in the alley between the huts. In those three heartbeats Tidwell closed the distance between them in four long strides, knife held low and poised. His left arm snaked forward and snapped his forearm across the guard's windpipe ending any possibility of an outcry as the knife darted home under the left shoulder blade.

The guard's reflexes were good. As the knife blade retracted into its handle, the man managed to flinch with surprise before his body went into the forced, suit-induced limpness ordered by his belt computer. Either the man had incredible reflexes or his suit was malfunctioning.

Tidwell eased the "dead" body to the ground, then swiftly removed the ID bracelet. As he rose to go, he glanced at the man's face and hesitated involuntarily. Even in the dark he knew him—Clancy! He should have recognized him from his style. Clancy smiled and winked to acknowledge mutual recognition. You couldn't do much else in a "dead" combat suit.

Tidwell paused long enough to smile and tap his fallen rival on the forehead with the point of his knife. Clancy rolled his eyes in silent acknowledgement. He was going to have a rough time continuing his argument that knives were inefficient after tonight.

Then the major was moving again. Friendship was fine, but he had a job to do and he was running behind schedule. A diversion can only last so long. Quickly he backtracked Clancy's route, resheathing his knife and

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drawing his pistol as he went. A figure materialized out of the shadows ahead.

"I told you there wouldn't be anything there!" came the whispered comment.

Tidwell shot him in the chest, his weapon making a muffled "pfut", and the figure crumpled. Almost disdainfully, the major relieved him of his ID bracelet. Obviously this man wouldn't last long. In one night he had made two major mistakes: ignoring a sound in the night, and talking on Silent Guard. It was men like this that gave mercenaries a bad name.

He paused to orient himself. Up two more huts and over three. Abandoning much of his earlier stealth, he moved swiftly onward in a low crouch, pausing only at intersections to check for hostile movement. He had a momentary advantage with the two Quadrant Guards out of action, but it would soon come to an abrupt halt when the Roaming Guards made their *rounds*.

Then he was at his target, a hut indistinguishable from any of the other barracks or duty huts in the compound. The difference was that Intelligence confirmed and cross-confirmed that this was the Command Post of the compound.

No light could be seen from within and there were no guards posted outside to tip its position to the Enemy, but inside this hut was the nerve center of the Defense, all Tactical Officers as well as the communication equipment necessary to coordinate the troop movements in the area.

Tidwell unslung his pack and eased it to the ground next to him. Opening the flap, he withdrew four charges, checking the clock on each to ensure synchronization. He had seen beautiful missions ruled invalid because time of explosion (TOE) could not be verified, and it wasn't going to happen to him. He double-checked the clocks. He didn't know about the Communications or Oil Companies, but Timex should be making a hefty profit out of this war.

Tucking two charges under his arm and grasping one in each hand he made a quick circuit of the building, pausing at each corner just long enough to plant a charge on the wall. The fourth charge he set left-handed, the silenced pistol back in his right hand, eyes probing the dark. It was taking too long! The Roaming Guards would be around any minute now.

Rising to his feet he darted away, running at high speed now, stealth *being completely abandoned to speed*. Two huts away he slid to a stop, dropping prone and flattening against the wall of the hut. Without pausing to catch his breath, his left hand went to his throat mike.

"Decker! They're set! Blow it!"

Nothing happened.

"Decker! Can you read me? Blow it!" He tapped the mike with his fingernail.

Still nothing.

"Blow it, damn you . . ."

POW.

Tidwell rolled to his feet and darted

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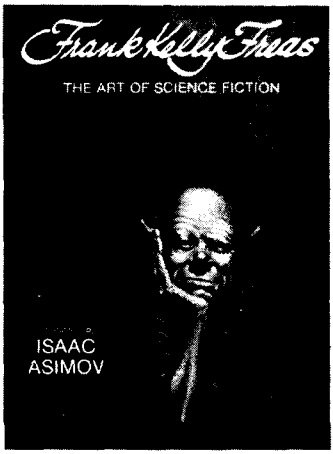

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around the corner. Even though it sounded loud in the stillness of night, that was no explosion. Someone was shooting, probably at him.

"Decker! Blow it!"

POW. POW.

No mistaking it now. He was drawing fire. Cursing, he snapped off a round in the general direction of the shots, but it was a lost cause and he knew it. Already he could hear shouts as more men took up the pursuit. If he could only lead them away from the charges. Ducking around a corner, he flattened against the wall and tried to catch his breath. Again he tried the mike.

"Decker!"

The door of the hut across the alley burst open, flooding the scene with light. As if in a nightmare he snapped off a shot at the figure silhouetted in the door as he scrambled backward around the corner.

POW.

He was dead . . . There was no impact of the "bullet," but his suit collapsed taking him with it as it crumpled to the ground. Even if he could move now, which he couldn't, it would do him no good. The same quartz light beam that scored the fatal hit on his suit deactivated his weapons. He could do nothing but lie there helplessly as his killer approached to relieve him of his ID bracelet. The man bending over him raised his eyebrows in silent surprise when he saw the rank of his victim, but he didn't comment on it. You don't talk to a corpse.

As the man moved on, Tidwell sighed and settled back to wait. No one would reactivate his suit until thirty minutes after the last shot was fired. His only hope would be if Decker would detonate the charges, but he knew that wouldn't happen. It was another foul-up.

Damn radios! Another mission blown to hell!

The major sighed again. Lying there in a dead suit was preferable to actually being dead, but that might be opened to debate when he reported in. Someone's head would roll over tonight's failure, and as the planner he was the logical choice.

The bar was clearly military, high-class military, but military none the less. One of the most apparent indications of this was that it offered live waitresses as an option. Of course, having a live waitress meant your drinks cost more, but the military men were one of the last groups of holdouts who were willing to pay extra rather than be served the impersonal hydrolift of a Serv-O-Matic.

Steve Tidwell, former major, and his friend Clancy were well entrenched at their favorite corner table, a compromise reached early in their friendship as a solution to the problem of how they could both sit with their backs to the wall.

"Let me get this round, Steve," ordered Clancy dipping into his pocket. "That severance pay of yours may have to last you a long time."

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"Hi Clancy, Steve," their waitress smiled delivering the next round of drinks. "Flo's tied up out back, so I thought I'd better get these to you before you got ugly and started tearing up the place."

"There's a love," purred Clancy, tucking a folded bill into her cleavage. She ignored him.

"Steve, what's this I hear about you getting cashiered?"

Tidwell took a sudden interest in the opposite wall. Clancy caught the waitress's eye and gave a minute shake of his head. She nodded knowingly and departed.

"Seriously, Steve, what *are* you going to do now?"

Tidwell shrugged.

"I don't know. Go back to earning my money in the live ammo set, I guess."

"Working for who? In case you haven't figured it out, you're blacklisted. The only real fighting left is in the Middle East, and the Oil Combine won't touch you."

"Don't be so sure of that. They were trying pretty hard to buy me away from the Itt-iots a couple of months ago."

Clancy snorted contemptuously.

"A couple of months. Hell, I don't care if it was a couple days. That was before they gave you your walking papers. I'm telling you they won't give you the time of day now. 'If you're not good enough for Communications, you're not good enough for Oil.' That'll be their attitude. You can bet on it."

Tidwell studied his drink in silence for a while, then took a hefty swallow.

"You're right, Clancy," he said softly. "But do you mind if I kid myself long enough to get good and drunk?"

"Sorry, Steve," apologized his friend. "It's just that for a minute there I thought you really believed what you were saying."

Tidwell lifted his glass in a mock toast.

"Well, here's to inferior superiors and inferior inferiors; the stuff armies are made of!"

He drained the glass and signaled for another.

"Really, Steve. You've got to admit the troops didn't let you down this time."

"True enough. But only because I gave them an assignment worthy of their talents: cannon fodder! 'Rush those machine guns and keep rushing until I say different!' Is it my imagination or is the quality of our troops acutally getting worse? And speaking of that, who was that clown on guard with you?"

Clancy sighed.

"Maxwell. Would you believe he's one of our best?"

"That's what I mean! Ever since the corporations started building their own armies all we get are superstars who can't follow orders and freeze up when they're shot at. Hell, give me some of the old-timers like you and Hassan. If we could build our own force with the corporations' bankroll,

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if we could get our choice of the crop and pay them eighteen to forty grand a year, we could take over the world in a month."

"Then what would you do with it?"

"Hell, I don't know. I'm a soldier, not a politician. But dammit, I'm proud of my work and if nothing else it offends my sense of aesthetics to see some of the slipshod methods and tactics that seem to abound in any war. So much could be done with just a few really good men."

"Well, we're supposed to be working with the best available men now. You should see the regular armies the governments field!"

"Regular armies! Wash your mouth out with Irish. And speaking of that . . ."

The next round of drinks was arriving.

"Say Flo, love. Tell Bonnie I'm sorry if I was so short with her last round. If she comes by again I'll try to make it up to her."

He made a casual pass at slipping his arm around her waist, but she sidestepped automatically without really noticing it.

"I'll tell her, Steve, but don't hold your breath about her coming back. I think you're safer when you're sulking!"

She turned to go and received a loud whack on her backside from Clancy. She squealed, then grinned and did an exaggerated burlesque walk away while the two men roared with laughter.

"Well, at least it's good to see you're loosening up a little," commented Clancy as their laughter subsided. "For a while there you had me worried."

"You know me. Pour enough Irish into me and I'll laugh through a holocaust! But you know, you're right, Clancy . . . about the men not letting me down, I mean. I think that's what's really irritating me about this whole thing."

He leaned back and rested his head against the wall.

"If the men had fallen down on the job, or if the plan had been faulty in it's logic, or if I had tripped the fence beams, or any one of a dozen other possibilities, I could take it quite calmly. Hazards of the trade and all that. But to get canned over something that wasn't my fault really grates."

"They couldn't find any malfunction with the Throat-Mikes?"

"Just like the other two times. I personally supervised the technicians when they dismantled it, checked every part and connection, and nothing! Even I couldn't find anything wrong and believe me, I was looking hard. Take away the equipment failure excuse, and the only possibility is an unreliable commander, and Stevey boy gets his pink slip."

"Say, could you describe the internal circuitry of those things to me?"

In a flash the atmosphere changed. Tidwell was still leaning against the wall in a drunken pose, but his body was suddenly poised and his eyes were

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clear and wary—watchful.

"Come on, Clancy. What is this? You know I can't breach confidence with an employer, even an ex-employer. If I did I'd never work again."

Clancy sipped his drink unruffled by his friend's challenge.

"You know it, and I know it, but my fellow Oil Slickers don't know it. I just thought I'd toss the question out to make my pass legit. You know the routine. 'We're old buddies and he's just been canned. If you'll just give me a pass tonight I might be able to pour a few drinks into him and get him talking.' You know the bit."

"Well, you're at least partially successful." Tidwell hoisted his glass again, sipped, and set it down with a clink. "So much for frivolity! Do you have any winning ideas for my future?"

Clancy tasted his drink cautiously.

"I dunno Steve. The last really big blow I was in was the Russo-Chinese War."

"Well, how about that one? I know they shut down their borders and went incommunicado after it was over, but that's a big hunk of land and a lot of people. There must be some skirmishes internally."

"I got out under the wire, but if you don't mind working for another ideology there might be something."

"Ideology, schmideology. Like I said before, I'm a soldier, not a politician. Have you really got a line of communication inside the Block?"

"Well . . ."

"Excuse us, gentlemen."

The two mercenaries looked up to find a trio of men standing close to their table. One was Oriental, the other two Caucasian. All were in business suits and carried attache cases.

"If you would be so good as to join us in a private room, I believe it would be to our mutual advantage."

"The pleasure is ours," replied Tidwell formally rising to follow. He caught Clancy's eye and raised an eyebrow. Clancy winked back in agreement. This had contract written all over it.

As they passed the bar, Flo flashed them an old aviator's "thumbs-up" sign signifying that she had noticed what was going on and their table would still be waiting for them when they returned.

To further their hopes, the room they were led to was one of the most expensive available at the bar. That is, one the management guaranteed for its lack of listening devices or interruptions.

There were drinks already waiting on the conference table, and the Oriental gestured for them to be seated.

"Allow me to introduce myself. I am Mr. Yamada."

His failure to introduce his companions identified them as bodyguards. Almost as a reflex, the two mercenaries swept them with a cold, appraising glance, then returned their attention to Yamada.

"Am I correct in assuming I am addressing Stephen Tidwell . . ." his

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eyes shifted, "Michael Clancy?"

The two men nodded silently. For the time being they were content to let him do the talking.

"Am I further correct in my information that you have recently been dismissed by the Communications Combine, Mr. Tidwell?"

Again Steve nodded. Although he tried not to show it, inwardly he was irritated. What had they done? Gone through town posting notices?

Yamada reached into his pocket and withdrew two envelopes. Placing them on the table, he slid one to each of the two men.

"Each of these envelopes contains $1,000 American. With them, I am purchasing your time for the duration of this conversation. Regardless of its outcome, I am relying on your professional integrity to keep the existence of this meeting as well as the context of the discussion itself in strictest confidence."

Again the two men nodded silently. This was the standard opening of a negotiating session, protecting both the mercenary and the person approaching him.

"Very well. Mr. Tidwell, we would like to contract your services for $60,000 a year plus benefits."

Clancy choked on his drink. Tidwell straightened in his chair.

"Sixty thousand . . ."

"And Mr. Clancy, we would further like to contract your services for $45,000 a year. This would of course not include the $18,500 we would have to provide for you to enable you to terminate your contract with the Oil Coalition.

By this time both men were gaping at him in undisguised astonishment. Clancy was the first to regain his composure.

"Mister, you don't beat around the bush, do you?"

"Excuse my asking," interrupted Steve, "But isn't that a rather large sum to offer without checking our records?"

"Believe me, Mr. Tidwell, we have checked your records. Both your records." Yamada smiled. "Let me assure you, gentlemen, this is not a casual offer. Rather, it is the climax of several months of exhaustive study and planning."

"Just what are we expected to do for this money?" asked Clancy cagily, sipping his drink without taking his eyes off the Oriental.

"You, Mr. Clancy, are to serve as aide and advisor to Mr. Tidwell. You, Mr. Tidwell, are to take command of the final training phases of, and lead into battle, a select force of men. You are to have final say as to qualifications of the troops as well as the tactics to be employed."

"Whose troops and in what battle are they to be employed?"

"I represent the Zaibatsu, a community of Japanese-based corporations, and the focus of our attention is the Oil vs. Communications War currently in process."

"You want us to lead troops against those idiots? Our pick of men and our tactics?" Clancy smiled. "Mister,

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you've got yourself a mercenary!"

Tidwell ignored his friend.

"I'd like a chance to view the force before I give you my final decision."

"Certainly, Mr. Tidwell," Yamada nodded. "We agree to this condition willingly because we are sure you will find the men at your disposal more than satisfactory."

"In that case, I think we are in agreement. Shall we start now?"

Tidwell started to rise, closely followed by Clancy, but Yamada waved them back into their seats.

"One last detail, gentlemen. The Zaibatsu believes in complete honesty with its employees, and there is something I feel you should be aware of before accepting our offer. The difficulties you have been encountering recently, Mr. Tidwell with your equipment and Mr. Clancy with your assignments, have been engineered by the Zaibatsu to weaken your current employers and ensure your availability for our offer."

Again both men gaped at him.

"But . . . how?" blurted Tidwell finally.

"Mr. Clancy's commanding officer who showed such poor judgment in giving him his team assignments is in our employment and acting on our orders. And as for Mr. Tidwell's equipment failure . . ." he turned a bland stare toward Steve, ". . . let us merely say that even though Communications holds the patent on the Throat-Mikes, the actual production was subcontracted to a Zaibatsu member. Something to do with the high cost of domestic labor. We took the liberty of making certain 'modifications' in their designs, all quite undetectable, with the result that we now have the capacity to cut off or override their command communications at will."

By this time the two mercenaries were beyond astonishment. Any anger they might have felt at being manipulated was swept away by the vast military implications of what they had just been told.

"You mean we can shut down their communications any time we want? And you have infiltrators at the command level of the Oiler forces?"

"In both forces, actually. Nor are those our only advantages. As I said earlier, this is not a casual effort. I trust you will be able to find some way to maximize the effect of our entry?"

With a forced calmness, Tidwell finished his drink, then rose and extended his hand across the table.

"Mr. Yamada, it's going to be a pleasure working for you!"

A few scrawny weeds dotted the cliff's face, outlining the outcroppings and crevices there. It would be a real obstacle, but there wasn't time to look for another route down.

The man at the top of the cliff didn't even break stride as he sprinted up to the edge of the precipice. He simply stepped off the cliff into nothingness, as did the three men following closely at his heels. For two long heartbeats they fell. By the second

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beat their swords were drawn, the world famous Katatas, samurai swords unrivaled for centuries for their beauty, their craftmanship and their razor edges. On the third heartbeat they smashed into a rock slide, the impact driving one man to his knees, forcing him to recover with a catlike forward roll. By the time he had regained his feet the others were gone darting and weaving through the straw dummies, swords flashing in the sunlight. He raced to join them, a flick of his sword decapitating the dummy nearest him.

The straw figures, twenty of them, were identical, save for a one inch square of brightly colored cloth pinned to them, marking five red, five yellow, five white, and five green. As they moved, each man struck only at the dummies marked with his color, forcing them to learn target identification at a dead run. Some were marked in the center of the forehead, some in the small of the back. It was considered a cardinal sin to strike a target that was not yours. A man who did not identify his target before he struck could as easily kill friend as foe in a firefight.

The leader of the band dispatched his last target and returned his sword to its scabbard in a blur of motion as he turned. He sprinted back toward the cliff through the dummies, apparently oblivious to the deadly blades still flashing around him. The others followed him, sheathing their swords as they ran. The man who had fallen was lagging noticeably behind.

Scrambling up the rock slide they threw themselves at the sheer cliff face and began climbing at a smooth effortless pace, finding handholds and toeholds where none could be seen. It was a long climb, and the distance between the men began to increase. Suddenly the second man in the formation dislodged a fist-sized rock that clattered down the cliffside. The third man rippled his body to one side and it missed him narrowly. The fourth man was not so lucky. The rock smashed into his right forearm and careened away. He lost his grip and dropped the fifteen feet back onto the rock slide.

He landed lightly in a three point stance, straightened, and gazed ruefully at his arm. A jagged piece of bone protruded from the skin. Shaking his head slightly, he tucked the injured arm into the front of his uniform and began to climb again.

As he climbed, a small group of men appeared below him. They hurridly cut down the remains of the straw dummies and began lashing new ones to the supporting poles. None of them looked up at the man struggling up the cliffside.

They had finished their job and disappeared by the time the lone man reached the top of the cliff. He did not pause or look back, but simply rolled to his feet and sprinted off again. As he did, five more men brushed past him, ignoring him completely and flung themselves off the cliff.

Tidwell hit the hold button on the videotape machine and the figures froze in midair. He stared at the

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screen for several moments, then rose from his chair and paced slowly across the thick carpet of his apartment. Clancy was snoring softly on the sofa, half buried in a sea of personnel folders. Tidwell ignored him and walked to the picture window where he stood and stared at the darkened training fields.

The door behind him opened and a young Japanese girl glided into the room. She was clad in traditional Japanese robes and was carrying a small tray of lacquered bamboo. She approached him quietly and stood waiting until he noticed her presence.

"Thanks, Yamiko," he said, taking his fresh drink from her tray.

She gave a short bow, and remained in place, looking at him. He tasted his drink, then realized she was still there.

"I'll be along shortly, Love. There's just a few things I've got to think out."

He blew a kiss at her and she giggled and retired from the room. As soon as she was gone, the smile dropped from his face like a mask. He slowly returned to his chair, leaned over and hit the rewind button. When the desired point had been reached, he hit the slow motion button and stared at the screen.

The four figures floated softly to earth. As they touched down, Tidwell leaned forward to watch their feet and legs. They were landing on uneven ground covered with rocks and small boulders, treacherous footing at best, but they handled it in stride. Their legs were spread and relaxed, molding to the contour of their landing point, then those incredible thigh muscles bunched and flexed, acting like shock absorbers. Their rumps nearly touched the rocks before the momentum was halted.

Tidwell centered his attention on the man who was going to fall. His left foot touched down on a head-sized boulder that rolled away as his weight came to bear. He began to fall to his left, but twisted his torso back to the centerline while deliberately buckling his right leg. Just as the awful physics of the situation seemed ready to smash him clumsily into the rocks, he tucked like a diver, curling around the glittering sword, and somersaulted forward rolling to his feet and continuing as if nothing had happened.

Tidwell shook his head in amazement. Less than a twentieth of a second. And he thought his reflexes were good.

The swordplay he had given up trying to follow. The blades seemed to have a life of their own, thirstily dragging the men from one target to the next. Then the leader turned. He twirled his sword in his left hand and stabbed the point toward his hip. An inch error in any direction would either lose the sword or run the owner through. It snaked into the scabbard like it had eyes.

Tidwell hit the hold button and stared at the figure on the screen. The face was that of an old Oriental, age drawing the skin tight across the face making it appear almost skull-like—

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Kumo. The old sensi who had been in command before Tidwell and Clancy were hired.

In the entire week they had been reviewing the troops they had not seen Kumo show any kind of emotion. Not anger, not joy—nothing. But he was a demanding instructor and personally lead the men in their training. The cliff was only the third station in a fifteen station obstacle course Kumo had laid out. The troops ran the obstacle course every morning to loosen up for the rest of the day's training. To loosen up.

Tidwell advanced the tape to the sequence in which the man's arm was broken. As the incident unfolded, he recalled the balance of that episode. The man had finished the obstacle course, broken arm and all. But his speed suffered, and Kumo sent him back to run the course again *before* he reported to the infirmary to have his arm treated.

Kumo ran a rough school. No one could argue with his results, though. Tidwell had seen things in this last week that he had not previously believed physically possible.

Ejecting the tape cassette, he refiled it, selected another, and fed it into the viewer.

The man on the screen was the physical opposite of Kumo who knelt in the background. Where Kumo was thin to the point of looking frail, this man looked like you could hit him with a truck without doing significant damage. He was short, but wide and muscular, looking for all the world like a miniature fullback, complete with shoulder pads.

He stood blindfolded on a field of hard-packed earth. His poise was relaxed and serene. Suddenly another man appeared at the edge of the screen, sprinting forward with upraised sword. As he neared his stationary target, the sword flashed out in a horizontal cut aimed to decapitate the luckless man. At the last instant before the sword struck, the blindfolded man ducked under the glittering blade and lashed out with a kick that took the running swordsman full in the stomach. The man dropped to the ground, doubled over in agony as the blindfolded man resumed his original stance.

Another man crept onto the field, apparently trying to drag his fallen comrade back to the sidelines. When he reached the writhing figure however, instead of attempting to assist him, the new man sprang over him high into the air launching a flying kick at the man with the blindfold. Again the blinded man countered, this time raising a forearm which caught the attacker's leg and flipped it in the air dumping him on his head.

At this point, the swordsman, who apparently was not as injured as he had seemed, rolled over and aimed a vicious cut at the defenders legs. The blindfolded man took to the air, leaping over the sword, and drove a heel down into the swordsman's face. The man fell back and lay motionless, bleeding from both nostrils.

Without taking his eyes from the

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screen, Tidwell raised his voice.

"Hey, Clancy."

His friend sat up on the sofa, scattering folders onto the floor and blinking his eyes in disorientation.

"Yeah, Steve?"

"How do they do that?"

Clancy craned his neck around and peered at the screen. Three men were attacking simultaneously, one with an axe, two with their hands and feet. The blindfolded man parried, blocked, and countered unruffled by death narrowly missing him at each turn.

"Oh, that's an old martial artist's drill—blindfold workouts. The theory is that if you lost one of your five senses, such as sight, the other four would be heightened to compensate. By working out blindfolded, you heighten the other senses without actually losing one."

"Have you done this drill before?"

Clancy shook his head. He was starting to come into focus again.

"Not personally. I've seen it done a couple of times, but nothing like this. These guys are good, and I mean really good."

"Who is that one, the powerhouse with the blindfold?"

Clancy pawed through his folders.

Here it is. His name's Aki. I won't read off all the black belts he holds, I can't pronounce half of them. He's one of the originals. One of the founding members of the martial arts cults that formed up after that one author tried to get the Army to return to the ancient ways, then killed himself when they laughed at him."

Tidwell shook his head.

"How many of the force came out of those cults?"

"About 95%. It's still incredible to me that the Zaibatsu had the foresight to start sponsoring those groups. That was over twenty years ago."

"Just goes to show what twenty years of training six days a week will do for you. Did you know some of the troops were raised into it by their parents? That they've been training with unarmed and armed combat since they could walk?"

"Yeah, I caught that. Incidentally, did I show you the results from the firing range today?"

"Spare me."

But Clancy was on his way to the case.

"They were firing Springfields today," he called back over his shoulder. "The old bolt-action jobs. Range at 500 meters."

Tidwell sighed. These firing range reports were monotonous, but Clancy was a big firearms freak.

"Here we go. These are the worse ten." He waved a stack of photos at Tidwell. On each photo was a man-shaped silhouette target with a small irregular-shaped hole in the center of the chest.

"There isn't a single shot grouping in there you couldn't cover with a nickel, and these are the worst."

"I assume they're still shooting five shot groups."

Clancy snorted.

"I don't think Kumo has let them hear of any other kind."

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"Firing position?"

"Prone unsupported. Pencil scopes battlefield zeroed at 400 meters."

Tidwell shook his head.

"I'll tell you, Clancy, man for man I've never seen anything like these guys. It's my studied and considered opinion that any one of them could take both of us one-handed. Even . . ."

He jerked a thumb at the figures on the screen behind them.

" . . . even blindfolded."

On the screen, a man tried to stand at a distance and stab the blindfolded Aki with a spear, with disastrous results.

Clancy borrowed Tidwell's drink and took a sip.

"And you're still standing by your decision? About extending our entry date to the war by two months?"

"Now look Clancy . . ."

"I'm not arguing. Just checking."

"They aren't ready yet. They're still a pack of individuals. A highly trained mob is still a mob."

"What's Kumo's reaction? That's his established entry date you're extending."

"He was only thinking about the new 'superweapons' when he set that date. He's been trained from birth to think of combat as an individual venture."

"Hey, those new weapons are really something, aren't they?"

"Superweapons or not those men have to learn to function as a team before they'll be ready for the war. They said I would have free rein in choosing men and tactics and by God this time I'm not going into battle until they're ready. I don't care if it takes two months or two years."

"But Kumo . . ."

"Kumo and I work for the same employer and they put *me* in charge. We'll move when *I* say we're ready, Tidwell said."

Clancy shrugged his shoulders.

"Just asking, Steve. No need to . . . Whoa. Could you back that up?"

He pointed excitedly at the screen. Tidwell obligingly hit the hold button. On the screen, two men were in the process of attacking simultaneously from both sides with swords. Images of Clancy and Tidwell were also on the screen standing on either side of Kumo.

"How far do you want it backed?"

"Back it up to where you interrupt the demonstration."

Tidwell obliged.

The scene began anew. There was an attacker on the screen cautiously circling Aki with a knife. Suddenly Tidwell appeared on the screen, closely followed by Clancy. Until this point they had been standing off camera watching the proceedings. Finally Tidwell could contain his feelings of skepticism no longer and stepped forward, silently holding his hand up to halt the action. He signaled the man with the knife to retire from the field then turned and beckoned two specific men to approach him. With a series of quick flowing motions he began to explain what he wanted.

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"This is the part I want to see. Damn. You know you're really good, Steve. You know how long it would take me to explain that using gestures? You'll have to coach me on it sometime. You used to fool around with the old Indian sign language a lot didn't you? Steve?"

No reply came. Clancy tore his eyes away from the screen and shot a glance at Tidwell. Tidwell was sitting and staring at the screen. Every muscle in his body was suddenly tense, not rigid, but poised as if he was about to fight.

"What is it, Steve? Did you see something?"

Without answering, Tidwell stopped the film, reversed it, then started it again.

Again the knifeman circled. Again the two mercenaries appeared on the screen. Tidwell punched the hold button and the action froze.

He rose from his chair and slowly approached the screen. Then he thoughtfully sipped his drink and stared at a point away from the main action. He stared at Kumo.

Kumo, the old sensi who never showed emotion. In the split second frozen by the camera, at the instant the two men stepped past him and interrupted the demonstration, in that fleeting moment, as he looked at Tidwell's back, Kumo's face was contorted into an expression of raw, naked hatred.

The men and women of the force were kneeling in the traditional students position, backs straight, hands open and resting palms down on their thighs. To all appearances they were at ease listening to the morning instruction.

This morning, however, the assembly was different. This morning the raised instructor's platform held a dozen chairs filled by various Corporation dignitaries. More importantly, the subject at hand was not instruction, but rather, the formal transfer of command from Kumo to Tidwell.

Tidwell was both nervous and bored. He was bored because he was always bored by long speeches, particularly if he was one of the main subjects under discussion. Yet there was still the nervousness born from the anticipation of directly addressing the troops for the first time as their commander.

The speech was in English, as were all the speeches and instructions. One of the prerequisites for the force was a fluent knowledge of English. That didn't make it any the less boring.

He grimaced about the platform again. The Corporation officials were sitting in Tweedle-dee and Tweedle-dum similarity, blank-faced and attentive. If nothing else in this stint of duty, he was going to try to learn some of the Oriental inscrutability. Depending on the Oriental, they viewed Westerners with distaste or amusement because of the ease with which their emotions could be read in their expressions and actions. The keynote of the Orient was control, and it

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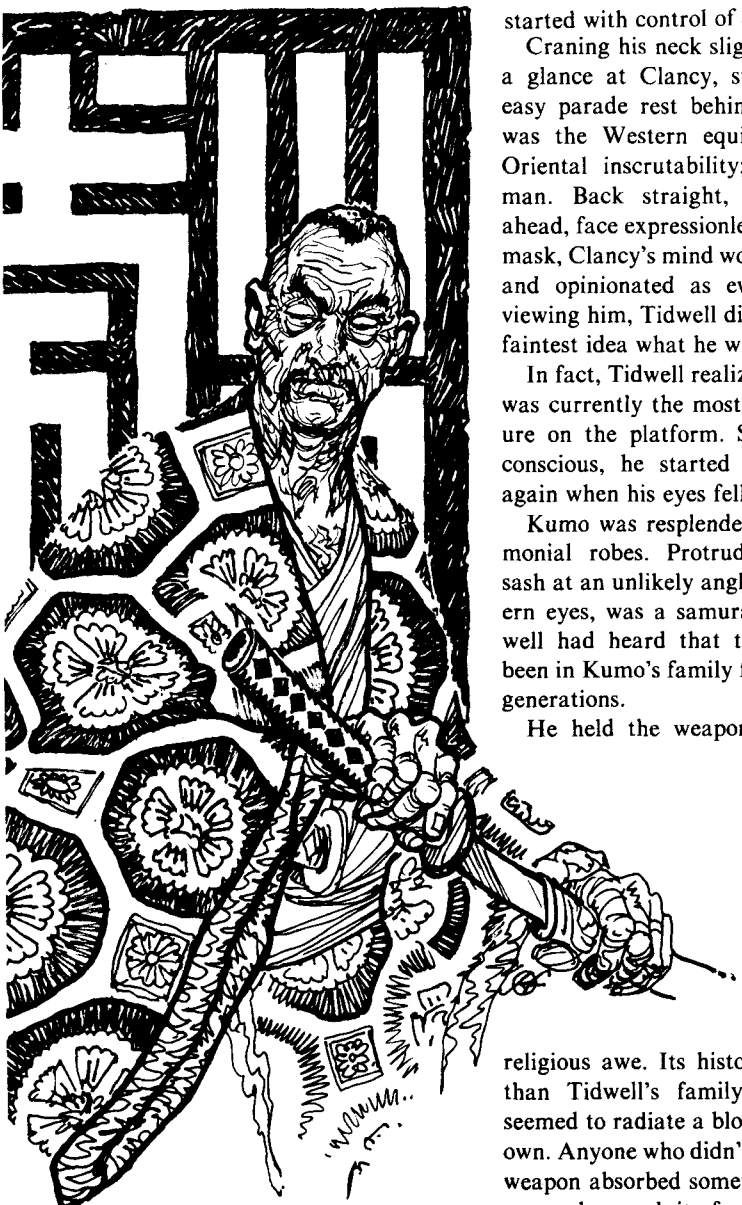

started with control of oneself.

Craning his neck slightly, he snuck a glance at Clancy, standing in an easy parade rest behind him. There was the Western equivalent to the Oriental inscrutability; the military man. Back straight, eyes straight ahead, face expressionless. Behind the mask, Clancy's mind would be as busy and opinionated as ever, but from viewing him, Tidwell did not have the faintest idea what he was thinking.

In fact, Tidwell realized, he himself was currently the most animated figure on the platform. Suddenly self-conscious, he started to face front again when his eyes fell on Kumo.

Kumo was resplendent in his ceremonial robes. Protruding from his sash at an unlikely angle to the Western eyes, was a samurai sword. Tidwell had heard that the sword had been in Kumo's family for over fifteen generations.

He held the weapon in almost a religious awe. Its history was longer than Tidwell's family tree, and it seemed to radiate a bloody aura of its own. Anyone who didn't believe that a weapon absorbed something from the men who used it, from the men it

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killed, anyone who didn't believe that a weapon couldn't have an identity and personality of its own had never held a weapon with a past.

He suddenly snapped back into focus. The speaker was stepping away from the microphone, looking at him expectantly, as were the others on the platform. Apparently he had missed his introduction and was "on".

He rose slowly, using the delay to collect his scattered thoughts, and stepped to the edge of the platform, ignoring the microphone to address the force directly. A brief gust of wind rippled the uniforms of his audience, but aside from that, there was no movement or reaction.

"Traditionally Japan has produced the finest fighting men in the world. The Samurai, the Ninjas, are all legendary for the prowess in battle."

There was no reaction from the force. Mentally he braced himself. Here we go!

"Also, traditionally, they have had the worst armies!"

The force stiffened without moving. Their faces remained immobile.

"The armies were unsuccessful because they fought as individuals, not as a team. As martial artists, you train the muscles of your body, the limbs of your body to work together, to support each other. It would be unthinkable to attempt to fight if your arms and legs were allowed to move in uncontrolled random motions."

They were with him, grudgingly, seeing where his logic was going.

"Similarly, an army can only be effective if the men and women in it work in cooperation and coordination with each other."

He had made his point. Time to back off a little.

"Different cultures yield different fighting styles. I am not here to argue which style is better, for each style has its time and place. What must be decided is what style is necessary in which situation. In this case, that decision has been made by the executives of the Zaibatsu. As a result of that decision, I have been hired to train and lead you."

Now came the real crunch.

"You are about to enter a highly specialized war. To successfully fight in this war, you must abandon any ideas you may have of nationalism or glory. You are mercenaries as I am a mercenary in the employment of the Zaibatsu complex. As such you must learn to fight, to think in a way which may be completely foreign to what you have learned in the past. To allow time for this training, the date for our entry into the war has been moved back by two months."

"I disagree, Mr. Tidwell."

The words were soft and quiet, but they carried to every corner of the assemblage. In an instant the air was electric. Kumo!

"I disagree with everything you have said."

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There it was. The challenge. The gauntlet. Tidwell turned slowly to face his attacker. Kumo's words were polite and soft as a caress, but the act of interrupting, let alone disagreeing, carried as much emotional impact in the Orient as a Western drill sergeant screaming his head off.

"In combat, the action is too fast for conscious thought. If one had to pause and think about coordination of one's limbs, the battle would be lost before a decision was made. It is for this reason that martial artists train, so that each limb develops eyes of its own, a mind of its own. This enables a fighter to strike like lightening when an opening presents itself. Similarly, we train each man to be a self-contained unit, capable of making decisions and acting as the situation presents itself. This means he will never be hamstrung by slow decisions or a break in communications with his superior. As to your 'specialized war', a trained fighting man should be able to adapt and function in any situation. Your failure to recognize this betrays your ignorance of warfare."

Tidwell shot a glance at the Corporate officials. No one moved to interfere or defend. He was on his own. They were going to let the two of them settle it.

"Am I to understand that you are questioning the qualifications of Mr. Clancy and myself?" He tried to keep his voice as calm as Kumo's.

"There is nothing to question. After two weeks here you presume to be an expert on our force and seek to change it. You expect the force to follow you because the Corporation tells them to. This is childish. The only way one may lead fighting men is if he holds their respect. That respect must be earned. It cannot be ordered. So far, all we have for proof is words. If your knowledge of battle is so vastly superior to ours, perhaps you could demonstrate it by defeating one of the force that we might see with our own eyes you are fit to lead us."

Tidwell was thunderstruck. This was unheard of. In paperback novels leaders would issue blanket challenges to their force to "any man who thinks he can lick me." In life it was never done. Leaders were chosen for their knowledge of strategy and tactics, not their individual fighting prowess. It was doubtful that either Patton or Rommel, or Genghis Khan for that matter, could beat any man in their command in a fistfight. No commander in his right mind would jeopardize his authority status by entering into a brawl.

It crossed his mind to refuse the challenge. He had already acknowledged the superior ability of the Japanese in individual combat, contesting only their group tactics. Just as quickly he rejected the thought.

No matter how insane it was, he could not refuse this challenge. He was in the Orient. To refuse would be to indicate cowardice, to lose face. He would have to fight this battle and win it.

"Sensi, I have publicly stated that the people of Japan have produced the

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greatest fighters in history. I will elaborate and say that I have no doubts that the men and women under your instruction equal or surpass those warriors of old in skill. Moreover, I must bow to your superior knowledge of their abilities and attitudes."

Kumo bowed his head slightly, acknowledging the compliment, but his eyes were still wary.

"However, what you tell me is that they must be convinced with action, not words. It has been always a characteristic of man that he can settle differences, pass his experiences from one generation to the next, and develop new ideas and concepts through the use of words. If you are correct in your appraisal of your students, if they are unable to be swayed by words, if the only way their respect can be earned is by action, then they are not men, they are animals."

Kumo's back stiffened.

"This is not surprising because you have trained them like animals."

There was an angry stirring in the ranks.

"Normally I would stand aside for men and women of such training, for they could defeat me with ease. But you tell me they are animals. As such I will accept your challenge, Kumo. I will stand and defeat the man or woman of your choice anytime, anyplace, with any weapon, for I am a man, and a man does not fear an animal."

There were scattered angry cries from the ranks. First singly, then as a group, the force rose and stood at the ready position, wordlessly volunteering to champion the force by facing Tidwell.

Tidwell suppressed an impulse to smile at the sensi's predicament. Kumo had obviously planned to face Tidwell himself. In slanting his retort toward the force, Tidwell had successfully forced Kumo into choosing a member from the ranks. A teacher cannot defend his students without implying a lack of confidence in their prowess. If the abilities of a student are challenged, the student must answer the challenge. Terrific. Would you rather face a tiger or a gorilla?

"Mr. Tidwell, your answer is eloquent if unwise. You are aware that such a contest would be fought to the death?"

Tidwell nodded. He hadn't been, but he was now. Inwardly he gritted his teeth. Kumo wasn't leaving him any outs.

"Very well. The time will be now, the place here. For weapons, you may have your choice."

Clever bastard! He's waiting to see weapons choice before he picks my opponent.

"I'll fight as I stand."

"I will also allow you to choose your opponent. I have faith in each of my students."

Damn! He'd reversed it. Now if Tidwell didn't choose Kumo for an opponent, it would appear he was probing for a weaker foe.

Tidwell scanned the force slowly, while he pondered the problem. Final-

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ly he made his decision.

Finishing his survey, he turned to Kumo once more.

"I will face Aki."

There was a quiet murmer of surprise as Aki rose and approached the platform. Obviously Tidwell was not trying to pick a weak opponent.

The powerhouse bounded onto the platform and bowed to Kumo. Kumo addressed him in rapid Japanese, then much to everyone's astonishment, removed his sword and offered it to his student. Aki's glance flickered over Tidwell, then he gave a short bow, shaking his head in refusal. Raising his head in calm pride, he rattled off a quick statement in Japanese, then turned to face Tidwell. Kumo inclined his head, then returned the sword to his sash. He barked a few quick commands, and several men sprang to clear the platform, relocating the dignitaries and their chairs to positions in front of and facing the scene of the upcoming duel.

Tidwell shrugged out of his jacket and Clancy stepped forward to take it.

"Are you out of your bloody mind, Steve?" he murmered under his breath.

"Do you see any options?"

"You could have let me fight him. If Kumo can have a champion, you should be able to have one too."

"Thanks, but I'd rather handle this one myself. Nothing personal."

"Just remember the option next time, if there is a next time."

"Come on Clancy, what could you do I can't in a spot like this?"

"For openers, I could blow him away while he's bowing in."

Clancy opened his hand slightly to reveal the derringer he was palming. Tidwell recognized it at once as Clancy's favorite holdout weapon, two shots, loads exploding on impact, accurate to 50 feet in the hands of an expert and Clancy was an expert.

"Tempting, but it wouldn't impress the troops much."

"But it would keep you alive!"

"Academic. We're committed now."

"Right. Win it."

"Win it!" The mercenaries' send-off. Tidwell focused his mind on that expression as he took his place facing Aki. At times like this when the chips were down it meant a lot more than all the good luck's in the world.

Suddenly the solution to the problem occurred to him. Chancy, but worth a try.

"Clancy, give me a pad and pencil."

They appeared magically. No aide is complete without those tools. Tidwell scribbled something quickly on the top sheet, ripped it from the pad, and folded it twice.

"Give this to Mr. Yamada."

Clancy nodded and took the note, stashing the pad and pencil as he went.

Everything was ready now. With relatively few adaptations a lecture assembly had been converted into an arena. As he was talking to Clancy, Tidwell had been testing the platform

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surface. It was smooth sanded wood, unvarnished and solid. He considered taking off his boots for better traction, but discarded the idea. He'd rather have the extra weight on his feet for the fight, increased impact and all that.

Kumo sat at the rear center of the platform, overseeing the proceedings as always. Then Clancy vaulted back onto the platform, his errand complete. Deliberately he strode across the platform and took a position beside Kumo on the side closest Tidwell. Kumo glared, but did not challenge the move.

Tidwell supressed a smile. Score one for Clancy. This was not a class exercise and Kumo was not an impartial instructor. It was a duel, and the seconds were now in position. One thing was sure, if he ever took a contract to take on the devil, he wanted Clancy guarding his flanks.

But now there was work to be done. For the first time he focused his attention on Aki, meeting his enemy's gaze directly. Aki was standing at the far end of the platform, relaxed and poised, eyes dead. The eyes showed neither fear nor anger. They simply watched, appraised, analyzed, and gave nothing in return. Tidwell realized that he was looking into a mirror, into the eyes of a killer. He realized it, accepted it, and put it out of his mind. He was ready.

He raised an eyebrow in question, Aki saw and gave a fractional nod of his head, more an acknowledgement than a bow, and the duel began.

Tidwell took one slow step forward and stopped, watching; Aki moved with leisurely grace into a wide, straddle-legged stance, and waited, watching.

Check! Aki was going to force Tidwell into making the opening move. He was putting his faith in his defense, in his ability to weather any attack Tidwell could throw at him and survive to finish the bout before his opponent could recover. However the duel went, it would be over quickly. Once Tidwell committed himself to an attack, it would either succeed or he would be dead.

Tidwell broke the tableau, sauntering diagonally to his right. As he approached the edge of the platform he stopped, studied his opponent, then repeated the process, moving diagonally to the left. Aki stood unmoving, watching.

To an unschooled eye, it would appear almost as if Tidwell were an art connoisseur, viewing a statue from various angles. To the people watching, it was Aki's challenge. He was saying 'Pick your attack, pick your angle. I will stop you and kill you.'

Finally Tidwell heaved a visible sigh. The decision was made. He moved slowly to the center of the platform, paused considering Aki, then placed his hands behind his back and began moving toward him head-on. Theatrically he came, step-by-step, a study in slow motion. The question now was how close? How close would Aki let him come before launching a counterattack? Could he bait Aki into

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striking first? Committing first?

Ten feet separated them. Step. Seven feet. Step.

Tidwell's right fist flashed out, whipping wide for a back-knuckle strike to Aki's temple, a killing blow. In the same instant Aki exploded into action, left arm coming up to block the strike, right fist driving out for a smashing punch to Tidwell's solar plexus. Then in mid-heartbeat the pattern changed. Tidwell's left hand flashed out and the sun glinted off the blade of a stiletto lancing for the center of Aki's chest. Aki's counter-punch changed and his right arm snapped down to parry the knife-thrust.

Instead of catching Tidwell's forearm, the block came down on the raised knife point as the weapon was pivoted in midthrust to meet the counter. The point plunged into the forearm, hitting bone and Tidwell ripped the arm open, drawing the knife back toward him.

As his arm came back, Tidwell jerked his knee up, slamming it into the wounded arm, then straightened his leg, snapping the toe of his boot into the wound for a third hit as Aki jerked backward, splintering the bone and sending his opponent off balance.

Aki reeled back in agony, then caught his balance and tried to take a good position, even though his right arm would no longer respond to his will. His eyes glinted hard now—a tiger at bay.

Tidwell bounded backward, away from his injured foe and backpedaled the far end of the platform. As Aki moved to follow, the mercenary pegged the knife into the platform at his feet, dropped to one knee, and held his arms out from his body at shoulder height.

"Aki! Stop!"

Aki paused, puzzled.

"Stop and listen!"

Suspicious, Aki retreated slowly to the far end of the platform, but he listened.

"Mr. Yamada! Will you read aloud the note I passed you before the fight began."

Mr. Yamada rose slowly from his seat, unfolded the note, and read:

"I will strike Aki's right forearm two to four times, then try to stop the fight."

He sat down and a murmer rippled through the force.

"The point of the fight was to determine if I was qualified to lead this force in battle. At this point I have shown that not only can I strike your champion repeatedly, but that I can predict his moves in advance. This will be my function as your commander, to guide you against an enemy I know and can predict, giving maximum effectiveness to your skills. Having demonstrated this ability, I wish to end this duel if my opponent agrees. I only hope he embraces the same philosophy I do, that if given a choice he will not waste lives. I will not kill or sacrifice my men needlessly. That is the way of the martial arts, and the way of the mercenary. Aki! Do you

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agree with me that the duel is over?"

Their eyes met for a long moment. Then slowly Aki drew himself up and bowed.

Kumo sprang to his feet, his face livid. He barked an order at Aki. Still in the bow, Aki raised his head and looked at Kumo, then at Tidwell, then back at Kumo and shook his head.

Clancy tensed, his hand going to his waistband. Tidwell caught his eye and shook his head in a firm negative.

Kumo screamed a phrase in Japanese at Aki, then snatched the sword from his sash and started across the platform at Tidwell.

Tidwell watched coldly as the sensi took three steps toward him, then stood up. As he did, the leg he had been kneeling on flashed forward and kicked the knife like a placekicker going for an extra point. The point snapped off and the knife somersaulted forward, plunging hilt deep into the chest of the charging swordsman. Kumo stopped, went to one knee, tried to rise, then the sword slipped from his grasp and he fell.

For several minutes there was silence. Then Tidwell turned to address his force.

"A great man has died here today. Training is cancelled for the rest of the day that we might honor his memory. Assembly will be at 0600 hours tomorrow to receive your new orders. Dismissed."

In silence the force rose and began to disperse. Tidwell turned to view the body again. Aki was kneeling before his fallen sensi. In silence Tidwell picked up the sword, removed the scabbard from Kumo's sash and resheathed the weapon. He stared at the body for another moment, then turned and handed the sword to Aki. Their eyes met, then Tidwell bowed and turned away.

"Jesus Christ, Steve. Have you ever used that placekick stunt before? In combat?"

"Three times before. This is the second time it worked."

"I saw it but I still don't believe it. If I ever mouth off about your knives again you can use one of them on me."

"Yeah, right. Say, can you be sure someone takes care of Aki's arm? I just want to go off and get drunk right now."

"Sure thing, Steve. Oh, someone wants to talk to you."

"Later, huh? I'm not up to it right now."

"It's the strawbosses."

Clancy jerked a thumb toward the row of Company officials.

"Oh."

Tidwell turned and started wearily toward the men, because they were his employers and he was a mercenary.

The straw dummies waited passively at the base of the cliff. Tidwell's interest was at a peak as he sat waiting with Clancy for the next group to appear. The two mercenaries were perched on the lip of the cliff about five meters to the left of the trail.

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They came, five of them darting silently from tree to tree like spirits. As they approached the cliff, the leader, a swarthy man in his thirties, held up his hand in a signal. The group froze, and he signaled one of the team forward. Tidwell smiled as a girl in her mid-twenties slung her rifle and dropped to her stomach, sliding forward to peer over the cliff. The leader knew damn well what was down there because he had run the course hundreds of times before, but he was playing it by the book and officially it was a new situation to be scouted.

The girl completed her survey, then slid backward for several meters before she rose to a half crouch. Her hands flashed in a quick series of signals to the leader. Clancy nudged Tidwell, who smiled again, this time from flattered pleasure. Since he had taken over, the entire force had begun using his habit of sign language. It was a high compliment. The only trouble was that they had become so proficient with it and had elaborated on his basic vocabulary to a point that now he sometimes had trouble following the signals as they flashed back and forth.

The leader made his decision. With a few abrupt gestures from him, the other three of the team, two men and a woman slung their rifles and darted forward, diving full speed off the cliff to confront their luckless "victims" below. The leader and the scout remained topside.

The two observing mercenaries straightened unconsciously. This was something new. The leader apparently had a new trick up his sleeve.

As his teammates sprinted forward, the leader reached over his shoulder and fished a coil of rope out of his pack. It was black, lightweight silk line, with heavy knots tied in it every two feet for climbing. He located and grasped one end, tossing the coil to the scout. She caught it and flipped it over the cliff, while the leader secured his end around a small tree with a quick-release knot. This done, he faded back along the trail about ten meters to cover the rear, while the scout unslung her rifle and eased up to the edge of the clff ready to cover her teammates below.

Clancy punched Tidwell's shoulder delightedly and flashed him a thumbs-up signal. Tidwell nodded in agreement. It was a sweet move. Now the three attackers below had an easy, secure route back out as well as cover fire if anything went wrong.

Tidwell felt like crowing. The reorganization of the force was working better than he would have dared hope. The whole thing had been a ridiculously simple three step process. First had been a questionnaire asking eight questions: Which four people in the force would you most like to team with? Why? Who would you be least willing to team with? Why? Who would you be most willing to follow as a leader? Why? Who would you be least willing to follow as a leader? Why?

The next step was to pass the data

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through the computers a few times and two jobs were done simultaneously. First, the five man teams were established along the lines of preference stated by the individuals, second, the deadwood and misfits were weeded out to be sent back to other jobs in the Corporate structure.

The final step was to pull various members of the teams for special accelerated training in the more specialized skills necessary in a fighting unit. He had had to argue with Clancy a little on this point, but had finally won. Clancy had felt the existing specialists should be seeded through the teams to round out the requirements regardless of preference lines, but Tidwell's inescapable logic was that in combat you're better off with a mediocre machine gunner you trust and can work with than an expert machine gunner you wouldn't turn your back on.

From then on the teams were inseparable. They bunked together, trained together, went on leave together, in short, they became a family. In fact, several of the teams had formed along family lines with mother, father, and offspring all in the same team, though frequently the leadership went to one of the offspring.

It was a weird, unorthodox way to organize an army, but it was bearing fruit. The teams were tight knit and smooth running and highly prone to coming up with their own solutions to the tactical problems Tidwell was constantly inventing for them. It was beyond a doubt the finest fighting force Tidwell had ever been associated with.

The attackers were regaining the top of the cliff now. Suddenly, a mischievous idea hit Tidwell. He stood up and wigwagged the team leader. With a few brief gestures he sketched out his orders. The team leader nodded, and began signaling his team. The scout recoiled the rope and tossed it to the team leader. He caught it, stowed it in his pack, surveyed the terrain, and faded back into a bush. Tidwell checked the terrain and nodded to himself. It was a good ambush. He couldn't see any of the team even though he had seen four of them take cover. He hadn't seen where the scout went after she tossed the rope.

Clancy was smiling at him.

"Steve, you're a real son-of-a-bitch."

Tidwell shrugged modestly, and they settled back to wait.

They didn't have to wait long. The next team came into sight, jogging along the trail in a loose group. The leader, a girl in her late teens that Clancy was spending most of his off-hours with, spotted the two sitting on the edge of the cliff. She smiled and waved at them. They smiled and waved back at her. They were still smiling when the ambush opened up.

The girl and the two men flanking her went down to the first burst of fire. The remaining two members dove smoothly under cover and started returning their fire.

Tidwell stood up.

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"All right! Break it up!"

There was an abrupt cease-fire.

"Everybody over here!"

The two teams emerged from their hiding places and sprinted over to the two mercenaries. Tidwell tossed his "activator key" to one of the survivors of the second team who ducked off to "revive" his teammates.

"Okay. First-off, ambushers. There's no point in laying an ambush if you're going to spring it too soon. Let 'em come all the way into the trap before you spring it. The way you did it, you're left with two survivors who've got you pinned down with your backs to a cliff!"

The "revived" members of the second team joined the group.

"Now then, Victims! Those kill suits are spoiling you rotten. You're supposed to be moving through disputed terrain. Don't bunch up where one burst can wipe out your whole team."

They were listening intently, soaking up everything he said.

"Okay, we've held up training enough. Report to the firing range after dinner for an extra hour's penalty tour."

The teams laughed as they resumed their training. Sending them to the firing range for a penalty tour was like sending a kid to Disneyland. Ever since the new weapons had arrived the teams had to be driven away from the ranges. They even had to take head count at meals to be sure teams didn't skip eating to sneak out to the range for extra practice.

The girl leading the second team shot a black look at Clancy as she herded her team off the cliff.

"Now who's the son of a bitch, Clancy old friend? Unless I miss my guess, she's going to have a few words for you tonight."

"Let her scream." Clancy's voice was chilly. "I'd rather see her gunned down here than when we're in live action. I wouldn't be doing her any favors to flash her warnings in training. Let her learn the hard way. Then she'll remember."

Tidwell smiled to himself. Underneath that easygoing nice guy exterior, was as cold and hard-nosed a mercenary as he was. Maybe colder.

"Nit-picking aside, Clancy, what do you think?"

"Think? I'll tell you, Steve. I think they're the meanest, most versatile fighting force the world has ever seen, bar none. Like you say, we're nit-picking. They're as ready now as they're ever going to be."

"How do you think they'd stack up against regular government troops?"

Clancy snorted.

"No contest—our team would eat them alive. It's the difference between a professional and an amateur. To us, war is a livelihood, not a hobby. I'd like nothing better than taking on some of the governmental boy scouts. It'd be a damn sight easier than moving in on the Oilers or the Itt-iots."

Tidwell felt a tightening in his gut, but he kept it out of his voice.

"I'm glad our opinions agree, Clancy, I just received new orders from

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Yamada this morning. The jump-off date has been changed. We're moving out next week."

"Spare change? Hey, man . . . any spare change?"

The youthful panhandlers were inevitable, even in a Brazilian airport. Tidwell strode on, ignoring the boy, but Clancy stopped and started digging in his pocket.

"Come on, Clancy! We've got to beat that mob through Customs."

"Yea, ain't it a bitch?" the youth joined in. "Do you believe this? It's been like this for almost a week."

Curiosity made Tidwell continue the conversation.

"Any word as to what they're doing?"

"Big tour program. Some Jap company is giving free tours instead of raises this year." He spat on the floor. "Damn cheap bastards. Haven't gotten a dime out of one of them yet."

"Here." Tidwell handed him a dollar. "This'll make up for some of it."

"Hey man, thanks. Say, take your bags to that skinny guy on the end and slip him ten, no hassle!"

The youth drifted off, looking for fresh game.

"Hypocrite!" accused Clancy under his breath. "Since when were you suddenly so generous."

"Since I could write it off on an expense account. That item is going in as a ten dollar payment for an informant. Come on, I'll buy you a drink out of the profits."

"Actually, I'd rather loiter around out here and make sure everything goes okay."

"Relax." Tidwell shot a glance down the terminal. "They're doing fine. Damnedest invasion I've ever seen."

At the other end of the terminal, the rest of their infiltration group was gathered, taking pictures and chattering together excitedly. Clancy and Tidwell had arrived by commercial flight half an hour after the charter plane, but the group was still fluttering around getting organized. They were perfect, right down to the overloaded camera bags and the clipboards. Even with his practiced eye, Tidwell could not have distinguished his own crew of cold killers from a hundred other groups of Orientals which frequent the tourist routes of the world.

"Hey! There you are!"

Both men winced. The irritating voice of Harry Beckington was unmistakable. After seven hours of his company on the plane, the mercenaries had not even had to confer before dodging him as they got off the plane. He would have made nice camouflage, but . . .

"Thought I lost you guys with all the slant-eyes in here!"

Their smiles were harder than usual to force.

"Sure are a lot of them," volunteered Clancy gamely.

"You know how they are, first a few, then you're hip deep in 'em."

"That's the way it is all right." smiled Tidwell.

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"Come on. Let me buy you boys a . . ."

As he spoke, he gestured toward the bar, and collided with one of the "tour group". He collided with Aki.

There was no reason for Aki to be passing so close, except that there was no reason for him not to. He was returning from the souvenir stand and the group of three men happened to be in his path. One of the forces' instructions for the invasion was to not avoid each other. Nothing is as noticeable to a watchful eye as a group of people studiously ignoring each other. It would have been unnatural for Aki to alter his path, so he simply tried to walk past them, only to run into Beckington's wildly flailing arm.

Aki's arm was still in a sling from his duel with Tidwell, and it suffered the full brunt of the impact. He instinctively bounced back, and stumbled over Beckington's briefcase.

"Watch it! Look what you did!"

Aki was the picture of politeness. He bobbed his head, smiling broadly.

"Please excuse. Most clumsy!"

"Excuse, Hell. You're going to pick all that stuff up."

Beckington seized his injured arm angrily, pointing to the scattered papers on the floor.

"For Christsake, Beckington" interrupted Tidwell, "The man's got a bad arm."

"Injured, my ass. He's probably smuggling something. How 'bout it? What are you smuggling?"

He shook the injured arm. Small beads of sweat appeared on Aki's forehead, but he kept smiling.

"No smuggle. Please . . . will pick up paper."

Beckington released him with a shove.

"Well, hurry up!"

"Careful, Beckington, he might know karate," cautioned Clancy.

"Shit! They don't scare me with that chop-chop crap!" snarled Beckington, but he stepped back anyway.

"Here are papers. Please excuse. Very clumsy."

Beckington gestured angrily. Aki set the papers down and retreated toward the other end of the terminal.

"Boy, that really frosts me. I mean, some people think just 'cause they're in another country they can get away with murder."

"Yea, people like that really burn me, too." said Tidwell dryly. The sarcasm was lost.

"Where were we? Oh yea . . . I was going to buy you boys a drink. You ready?"

"Actually, we can't."

"Can't, why not?"

"Actually, we're with Alcoholics Anonymous. We're here to open a new branch," interrupted Clancy.

"Alcoholics Anonymous?"

"Yes," said Tidwell blandly. "On the National Board, actually."

"But I thought you were drinking on the plane."

"Oh, that," interrupted Clancy. "Actually it was iced tea. We've found that lecturing people while we're traveling just alienates them, so we try to blend with the crowd until

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we have time to do some real work."

"Have you ever stopped to think what alcohol does to your nervous system? If you can hold on a second we've got some pamphlets here you could read."

Tidwell started rummaging energetically in his flight bag.

"Ah . . . actually I've got to run now. Nice talking with you boys.

He edged backward, started away toward the bar, then turned, smiled, and made a beeline for the Men's Room.

Tidwell collapsed in laughter.

"Alcoholics . . . Oh Christ, Clancy, where do you come up with those?"

"Huh? Oh, just a quickie. It got rid of him didn't it?"

"I'll say, well, let's go before he comes back."

"Um, can we stall here for a few minutes, Steve?"

Tidwell stopped laughing in midbreath.

"What is it? Trouble?"

"Nothing definite. Don't want to worry you if it's nothing. Just talk about something for a few minutes."

"Terrific. Remind me to fire you for insubordination. How about that Aki? Do you believe he managed to keep his cool through all that crap?"

"Uh-huh."

"That Beckington is a real shit. If we weren't under contract, I'd like nothing better than realigning his face a little."

"Uh-huh."

"Dammit that's enough! If you don't tell me what's up, I'll cut your liquor allotment!"

"Well . . . we might have a little problem."

"Come on Clancy!"

"You saw where Beckington went?"

"Yea, into the Men's Room. So?"

"So, Aki's in there."

"What?"

"Doubled back and ducked in while we were doing the A.A. bit with Beckington. Probably needed to take a pain killer."

"Who else is in there?"

"Just the two of them."

"Christ! You don't think Aki . . ."

"Not out here in the open, but it must be awfully tempting in there."

The two men studied the ceiling in silence for several moments. Still no one emerged from the Men's Room. Finally Tidwell heaved a sigh and started for the door. Clancy held up a hand.

"Come on Steve. Why not let him do . . ."

"Because we can't afford any attention. None at all. All we need is to have them detain all the Orientals in the airport for a police investigation. Now let's go!"

The mercenaries started for the door. Tidwell raised his hand to push his way in, and the door opened.

"Oh, hi boys. How's the 'dry' business? Just do me a favor and don't close down the bars until after I've left the country, know what I mean?"

"Um . . . Sure, Harry. Just for

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you—anything you say."

"Well, see you around."

He brushed past them and strode toward the bar.

Almost mechanically, the two mercenaries pushed open the door and entered the washroom. Aki looked up inquiringly as he dried his hand on a blo-jet.

"Um . . . are you okay Aki?"

"Certainly, Mr. Tidwell, why do you ask?"

The two men shifted uncomfortably.

"We . . . ah . . . we just thought that after what happened outside . . ."

Aki frowned for a moment, then suddenly smiled with realization.

"Ah! I see. You feared that I might . . . Mr. Tidwell, I am a mercenary under contract. Rest assured I would do nothing to draw needless attention to our force or myself."

"Tell the driver to slow up. It should be right along here somewhere."

"I still haven't seen the buses." Clancy scowled through the dust and bug-caked windshield of the truck.

"Don't worry they'll be . . . there they are!"

The buses were rounding the curve ahead bearing down on them with the leisurely pace characteristic of this country. Tidwell watched the vehicle occupants as they passed, craning his neck to see around the driver. The bus passengers smiled and waved joyously, but Tidwell noticed none of them had their cameras out.

The mercenaries smiled and waved back.

"The fix is in!" chortled Clancy.

"Did you see any empty seats?"

"One or two. Nothing noticeable."

"Good. Look there it is up ahead."

Beside the road there was a small soft shoulder, one of the few along this hilly, jungled route. Without being told, the driver pulled off the road and stopped. They sat motionless for several long moments, then, Aki stepped out of the brush and waved. At the signal, the driver cut the engine and got out of the car. The two mercenaries also piled out of the car, but unlike the driver who leisurely began taking off his shirt, strode around to the back of the truck and opened the twin doors. Two men were in the back, men of approximately the same description and dressed identically to Tidwell and Clancy. They didn't say anything, but strode to the front of the truck and took the mercenaries' places in the cab. Like the driver, they had been briefed.

The two mercenaries turned their attention to the crates in the back. Aki joined them.

"Are the lookouts in place?"

"Yes, sir."

"You worry too much, Steve." chided Clancy. "We haven't seen another car on this road all day."

"I don't want this messed up by a bunch of gawking tourists."

"So we stop 'em. We've done it before and we've got the team to do it."

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"And lose two hours covering up? No thanks."

"I'm going to check the teams. I'll send a couple back to give you a hand here."

He hopped out of the truck and strode down the road, entering the brush at the point where Aki had emerged.

Fifteen feet into the overgrowth was a clearing where the teams were undergoing their metamorphosis. Nine in the clearing, and one in the truck made ten. Two full teams, and the buses had looked full.

The team members were in various stages of dress and undress. One of the first things lost when the teams were formed were any vague vestige of modesty. The clothes had been cunningly designed and tailored. Linings were ripped from jackets and pants, false hems were removed, and the familiar kill-suits began to come into view.

Clancy arrived carrying the first case. He jerked his head and two already clothed team members darted back toward the road. Setting the carton down, Clancy slit open the sealing tape with his pocket knife. He folded the flaps back, revealing a case of toy robots.

Easing them out onto the ground, he opened the false bottom where the swamp boots were kept. These were not new boots. They were the member's own broken-in boots. Clancy grabbed his pair and returned to a corner of the clearing to convert his clothes. One by one, the members claimed their boots and a robot and stooped to finish dressing.

Tidwell had worn his boots to speed the changing process. He whistled low and gestured, and a team member tossed him a robot. He caught it and opened the lid on its head in a practiced motion. Reaching in carefully, he removed the activator unit for his kill-suit and checked it carefully. Satisfied, he plugged it into his suit and rose to check the rest of the progress, resealing the lid on the robot and stacking it by the carton as he went.

Conversion was in full swing as more cartons arrived. The shoulder straps came off the camera gadget bags, separated, and were reinserted to form the backpacks. Fashionable belts with gaudy tooling were reversed to reveal a uniform black with accessory loops for weapons and ammunition.

Tidwell particularly wanted to check the weapons assembly. Packing material from the toy cartons was scooped into plastic bags, moistened with a fluid from the bottles in the camera bags, and the resulting paste pressed into molds previously covered by the boots to form rifle stocks. The camera tripods were dismounted, the telescoping legs separating for various purposes. First, the rounds of live ammo were emptied out and distributed. Tidwell smiled grimly at this. All the forces weapons were 'convertibles.' That is, they were basically quartz crystal weapons, but were also rigged to fire live ammo if the other forces tried to disclaim their entry

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into the corporate wars.

The larger section of the legs separated into three parts, to form the barrels for both the flare pistols and the short double-barreled shotguns so deadly in close fighting. The middle sections were fitted with handles and a firing mechanism to serve as launchers for the minigrenades which up to now had been carried in the 35mm film canisters hung from the pack straps.

The smallest diameter section was used for the rifle barrel, fitted with a fountain-pen telescopic sight. The firing mechanisms were cannibalized from the cameras and various toys which emerged and were reinserted in the cartons.

One carton only was not refilled with its original contents. This carton was filled with rubber daggers and swords, samurai swords. These were disbursed to the members, who used their fingernails to slice through and peel back the rubber coating to reveal the actual weapons, glittering in the sun. These were not rigged for use on kill-suits.

The label on the empty box was pulled back to reveal another label declaring the contents camera parts, and the skeletons of the cannibalized cameras were loaded in, packed by the shreds of the outer clothing now torn to unrecognizable pieces.

The cartons were resealed and reloaded, and the truck was again sent along its way with a driver, two passengers, and a load of working toys and camera gear.

Tidwell watched it depart and smiled grimly. They were ready.

"Call in the lookouts, Clancy. We've got a long hike ahead of us."

"What's with Aki?"

The Oriental was running toward them waving excitedly.

"Sir! Mr. Yamada is on the radio."

"Yamada?"

"This could be trouble, Steve."

They returned hurriedly to the clearing where the team was gathered around the radio operator.

Tidwell grabbed the mike.

"Mr. Tidwell." Yamada's voice came through without static. "You are to proceed to the rendezvous point to meet with the other teams at all haste. Once there do not, I repeat, do not carry out any action against the enemy until you have received further word from me."

Tidwell frowned, but kept his voice respectful.

"Message received. Might I ask why?"

"You are not to move against the enemy until we have determined who the enemy is."

"What the hell . . ."

"Shut up, Clancy. Please clarify, Mr. Yamada."

"At the moment there is a cease fire in effect on the war. The government of the United States has chosen to intervene."

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CORPORATION WARS CHARGED A federal grand jury was appointed today to investigate alleged involvement of several major corporations in open warfare with each other. The Corporations have refused to comment on charges that they have been maintaining armies of mercenaries on their payrolls for the express purpose of waging war on each other. Included on the list of corporations charged were several major oil conglomerates as well as communications and fishing concerns. The repercussions may be international as some of the corporations involved (continued on pg. 28)

CORPORATIONS DEFY ORDERS In a joint press release issued this afternoon, the corporations under investigation for involvement in the alleged Corporate Wars flatly refused to comply with government directives to cease all hostilities toward each other of a warlike nature and refrain from any future activities. They openly challenge the government's authority to intervene in these conflicts, pointing out that the wars are not currently being conducted within the boundaries of the US or its territories. They have asked the media to relay to the American people their counter-charges that the government is trying to pressure them into submission by threatening to move against the corporations' US holdings. They refer to those threats as "blatant extortion" being carried on in the name of justice, pointing out the widespread chaos which would be caused if their services to the nation were interrupted. (continued pg. 18)

AFRICANS JOIN CORPORATE OPPOSITION The League of African Nations added their support to the rapidly growing list of countries seeking to control the multinational corporations. With the addition of these new allies virtually all major nations of the Free World are united in their opposition to the combined corporate powers. Plans are currently being formulated for a united armed intervention if the corporations continue to defy (continued pg. 12)

WORLDWIDE PROTESTS SCHEDULED Protest demonstrations are scheduled for noon tomorrow in every major city across the globe as citizen groups from all walks of life band together to voice their displeasure of the

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proposed governmental armed forces intervention in the Corporate Wars. War is perhaps the least popular endeavor governments embark on, and it is usually sold to the populace as a step necessary to ensure national security, a reason which many feel does not apply in this situation. Groups not usually prone to voicing protest have joined the movement, including several policemen's unions and civil service organizations. Government officials (cont. pg.8)

COURT MARTIALS THREATENED Armed Forces officials announced today that any military personnel taking part in the planned demonstrations will be arrested and tried for taking part in a political rally whether or not they are in uniform.

GOVERNMENT — CORPORATE TALKS SUSPENDED Negotiation sessions seeking peaceful settlement between the Combined Corporations and the United Free World Governments came to an abrupt halt today when several government negotiators walked out of the sessions. Informed sources say that the eruption occurred as a result of an appeal on the part of the corporations to the governments to "call off a situation involving needless bloodshed which the government troops could not hope to win". It is believed that what they were alluding to were their alleged "superweapons" which the governments continue to discount. "A weapon is only as good as the man behind it" a high-ranked U.S. Army officer is quoted as saying "And we have the best troops in the world. With scant hours remaining before the deadline (continued pg.7)

Lieutenant Worthington, US Army, was relieved as the convoy pulled into the outskirts of town. He only wished his shoulders would relax. They were still tense to the point of aching.

He tried to listen to the voices of the enlisted men riding in the back of the truck as they joked and sang, but shrugged it off in irritation.

The bloody fools. Didn't they know they had been in danger for the last hour? They were here to fight mercenaries, hardened professional killers. There had been at least a dozen places along the road through the jungle that seemed to be designed for an ambush, but the men chatted and laughed seemingly oblivious to the fact the rifles on their laps were empty.

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The lieutenant shook his head. That was one Army policy to which he took violent exception to. He knew that only issuing ammunition when the troops were moving into a combat zone reduced accidents and fatal arguments, but damn it for all intents and purposes the whole country was a combat zone. It was fine and dandy to make policies when you're sitting safe and secure at the Pentagon desk looking at charts and statistics, but it wasn't reassuring when you're riding through potential ambush country with an empty weapon.

He shot a guilty sidelong glance at the driver. He wondered if the driver had noticed that Worthington had a live clip in his pistol—probably not. He had smuggled it along and switched the clips in the john before they got on the trucks. Hell, even if he had noticed he probably wouldn't report him. He was probably glad that someone in the truck had a loaded weapon along.

They were in town now. The soldiers in back were whooping and shouting crude comments at the women on the sidewalk. Worthington glanced out the window, idly studying the buildings as they rolled past. Suddenly he stiffened.

There, at a table of a sidewalk cafe, were two mercenaries in the now famous kill-suits leisurely sipping drinks and chatting with two other men in civilian dress. The lieutenant reacted instantly.

"Stop the truck!"

"But sir . . ."

"Stop the truck, damn it!"

Worthington was out of the truck even before it screeched to a halt, fumbling his pistol from its holster. He ignored the angry shouts behind him as the men in back were tossed about by the sudden braking action and leveled his pistol at the mercenaries.

"Don't move, either of you!"

Still they ignored him. Worthington was starting to feel foolish, aware of the driver peering out the door behind him. He was about to repeat himself when one of the mercenaries noticed him. He tapped the other one on the arm, and the whole table craned their necks to look at the figure by the truck.

"You are to consider yourselves my prisoners. Put your hands on your head and face the wall!"

They listened to him, heads cocked in alert interest. When he was done, one of the mercenaries replied with a rude gesture of international significance. The others at the table rocked with laughter, then they returned to their conversation.

Worthington suddenly found himself ignored again. Reason vanished in a wave of anger and humiliation. Those bastards!

The gun barked and roared in his hand, startling him back to his senses. He had not intended to fire. His hand must have tightened nervously and . . .

Wait a minute! Where were the mercenaries? He shot a nervous glance around. The table was de-

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serted, but he could see the two men in civilian clothes lying on the floor covering their heads with their arms. Neither seemed to be injured. Thank God for that! There would have been hell to pay if he shot a civilian. But where were the mercenaries?

The men were starting to pile out of the truck behind him, clamoring to know what was going on. One thing was sure, he couldn't go hunting mercenaries with a platoon of men with empty rifles. Suddenly a voice rang out from the far side of the street.

"Anybody hurt over there?"

"Clean miss!" rang out another voice from the darkened depths of the cafe.

The lieutenant squinted, but couldn't make out anyone.

"Are they wearing kill-suits?" came a third voice from further down the street.

"As a matter of fact they aren't!" shouted another voice from the alley along side the cafe."

"That was live ammo?"

"I believe it was."

The men by the truck were milling about craning their necks at the unseen voices. Worthington suddenly realized he was sweating.

"You hear that, boys? Live ammo!"

"Fine by us!"

The lieutenant opened his mouth, shout something, anything, but it was too late. His voice was drowned out by the first ragged barrage. He had time to register with horror that it was not even a solid hail of bullets that swept their convoy. It was a vicious barrage of snipers, massed marksmen. One bullet, one soldier. Then a grenade went off under the truck next to him and he stopped registering things.

There was no doubt in anyone's mind as to the unfortunate nature of the incident. For one thing, one of the men in civilian clothes sharing a drink with the mercenaries was an Italian officer with the Combined Government Troops who collaborated the Corporation's claim the action was in response to an unprovoked attack by the convoy.

The fourth man was a civilian, a reporter with an international news service. His syndicated account of the affair heaped more fuel on an already raging fire of protest on the home fronts against the troops' intervention in the Corporate Wars.

Even so, the Corporations issued a formal note of apology to the Government Forces for the massacre. They further suggested that the government troops be more carefully instructed as to the niceties of off-hours behavior to avoid similar incidents in the future.

An angry flurry of memos did the rounds of the Government Forces trying vainly to find someone responsible for issuing the live ammo.

The mayor of the town was more direct and to the point. He withdrew the permission for the American troops to be quartered in the town, forcing them to bivouac outside the city limits. Further, he signed into law an ordinance forbidding the Americans from coming into town with any

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form of firearm, loaded or not, on their person.

This ordinance was rigidly enforced, and American soldiers in town were constantly subject to being stopped and searched by the local constables, to the delight of the mercenaries who frequently swaggered about with loaded firearms worn openly on their hips.

Had Lieutenant Worthington not been killed in the original incident, he would have doubtlessly been done in by the troops under him, then definitely by his superiors.

The sniper raised his head a moment to check the scene below before settling in behind the sights of his rifle.

The layout was as it had been described to him. The speaker stood at a microphone on a raised wooden platform in the square below him. The building behind him was a perfect backdrop. With the soft hollow-point bullets he was using there would be no ricochets to endanger innocent bystanders in the small crowd which has assembled.

Again he lowered his head behind the scope and prepared for his shot. Suddenly, there was the sound of a "tunggg" and he felt the rifle vibrate slightly. He snapped his head upright and blinked in disbelief at what he saw. The barrel of his rifle was gone, seared cleanly away by some unseen force.

He rolled over to look behind him and froze. Three men stood on the roof behind him. He hadn't heard them approach. Two were ordinary looking, perhaps in better shape than the average person. The third was Oriental. It was the last man who commanded the sniper's attention. This was because of the long sword, bright in the sun, which the man was holding an inch in front of the sniper's throat.

The man behind the Oriental spoke.

"Hi guy! We've been expecting you."

The speaker was becoming redundant. The crowd was getting a little restless. Why did the man insist on repeating himself for the third and fourth time, not even bothering to change his phrasing much?

Suddenly there was a stir at the outer edge of the crowd. Four men were approaching the podium with a purposeful stride, three men shoving a fourth as they came.

They bounded onto the platform, one taking the microphone over the speaker's protests.

"Sorry, Senator, but part of the political tradition is allowing equal time to opposing points of view."

He turned to the crowd.

"Good afternoon ladies and gentlemen. You've been very patient with the last speaker, so I'll try to keep this brief. I represent the Corporations the Senator here has been attacking so vehemently."

The crowd stirred slightly, but remained in place, their curiosity piqued.

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"Now, you may be impressed with the senator's courage, attacking us so often publicly as he has been doing lately when it's known we have teams of assassins roaming the streets. We were impressed, too. We were also a bit curious. It seemed to us he was almost inviting an assassination attempt. However, we ignored him, trusting the judgment of the general public to see him as the loudmouthed slanderer he is."

The senator started forward angrily, but the man at the mike froze him with a glare.

"Then he changed. He switched from his pattern of half-truths and distortions that are a politican's stock and trade and moved into the realm of outright lies."

"This worried us a bit. It occurred to us that if someone did take a shot at him, that it would be blamed on us and give credence to all his lies. Because of this, we've been keeping a force of men on hand to guard him whenever he speaks to make sure nothing happened to him."

He paused and nodded to one of his colleagues. The man put his fingers in his mouth and whistled shrilly.

Immediately on the rooftops and in the windows of the buildings surrounding the square, groups of men and women stepped into view. They were all dressed in civilian clothes, but the timeliness of their appearance, as well as the uniform coldness with which they stared down at the crowd left no doubt that they were all part of the same team.

The man whistled again, and the figures disappeared. The man at the mike continued.

"So we kept watching the senator, and finally today we caught something. This gentleman has a rather interesting story to tell."

The sniper was suddenly thrust forward.

"What were you doing here today?"

"I want a lawyer. You can't . . ."

The Oriental twitched. His fist was a blur as it flashed forward to strike the sniper's arm. The man screamed, but through it the crowd heard the bone break.

"What were you doing here today?" The questioner's voice was calm, as if nothing had happened.

"I . . ."

"Louder!"

"I was supposed to shoot at the senator."

"Were you supposed to hit him?"

"No." the man was swaying slightly from the pain in his arm.

"Who hired you?"

The man shook his head. The Oriental's fist lashed out again.

"The senator!" The man screamed.

A murmur ran through the crowd. The senator stepped hurriedly to the front of the platform.

"It's a lie!" he screamed, "They're trying to discredit me. They're faking it. That's one of their own men they're hitting. It's a fake."

The man with the microphone ignored him. Instead he pointed to a policeman in the crowd.

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"Officer! There's usually a standing order about guarding political candidates. Why wasn't there anyone from the police watching those rooftops?"

The officer cupped his hands to shout back. "The senator insisted on minimum guards. He pulled rank on the chief."

The crowd stared at the senator who shrank back before their gaze. The man with the mike continued.

"One of the senator's claims is that the Corporations would do away with free speech. I feel we have proved this afternoon that that statement is a lie. However, our business like any business depends on public support, and we will move to protect it. As you all know, there's a war on."

He turned to glare at the senator.

"It is my personal opinion that we should make war on the warmakers. Our targets should be the people who send others out to fight. However, that is only my personal opinion. The only targets in my jurisdiction are front-line soldiers."

He looked out over the crowd again.

"Are there any reporters here? Good. When this man took money to discredit the Corporations, he became a mercenary, the same as us. As such he falls under the rules of war. I would appreciate it if you would print this story as a warning to any other two-bit punks who think it would be a good idea to pose as a Corporate mercenary."

He nodded to his colleagues on the platform. One of the men gave the sniper a violent shove that sent him sprawling off the platform, drew a pistol from under his jacket, and shot him.

The policeman was suspended for allowing the mercenaries to leave unchallenged, a suspension that caused a major walk-off on the police force.

The senator was defeated in the next election.

The young Oriental couple ceased their conversation abruptly when they saw the group of soldiers, at least a dozen, on the sidewalk ahead of them. Without even consulting each other they crossed the street to avoid the potential trouble. Unfortunately, the soldiers had also spotted them and also crossed the street to block their progress. The couple turned to retrace their steps, but the soldiers, shouting now, ran to catch them.

Viewed up close, it was clear the men had been drinking. They pinned the couple in a half circle, backing them against a wall, where the two politely inquired as to what the soldiers wanted.

The soldiers admitted it was the lady who was the reason for their attention and invited her to accompany them as they continued on their spree.

The lady politely declined, pointing out that she already had an escort.

The soldiers waxed eloquent, pointing out the numerous and obvious shortcomings of the lady's escort, physically and probably financially. They allowed as how the fourteen of

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them would be better able to protect the lady from the numerous gentlemen of dubious intent she was bound to encounter on the street. Furthermore, they pointed out, that even though their finances were admittedly depleted by their drinking, that by pooling their money they could doubtless top any price her current escort had offered for her favors.

At this, her escort started forward to lodge a protest, but she laid a gentle restraining hand on his arm and stepped forward smiling. She pointed out that the soldiers were perhaps mistaken in several of their assumptions about the situation at hand.

First, they were apparently under the impression that she was a call girl, when in truth, that she was gainfully employed by the Corporate forces. Second, her escort for the evening was not a paying date, but rather her brother. Finally, she pointed out that while she thanked them for their concern and their offer, that she was more than capable of taking care of herself.

By the time she was done explaining this last point, the soldiers had become rearranged. Their formation was no longer in a half circle, but rather scattered loosely for several yards along the street. Also, their position in that formation was horizontal rather than vertical.

Her explanation complete, the lady took her brother's arm and they continued on their way.

As they walked, one of the soldiers groaned and tried to rise. She drove the high heel of her shoe into his forehead without breaking stride.

Julian rolled down his window as the service station attendant came around to the side of his car.

"Fill it up with premium."

The attendant peered into the back seat of the car.

"Who do you work for, sir?"

"Salesman for a tool and die company."

"Got any company ID?"

"No, it's a small outfit. Could you fill it up, I'm in a hurry."

"Could you let me see a business card or your samples? If you're a salesman . . ."

"All right, all right. I'll admit it. I work for the government. But . . ."

The attendant's face froze into a mask.

"Sorry, sir." he started to turn away.

"Hey, wait a minute!" Julian sprang out of the car and hurried to catch up with the retreating figure. "Come on, give me a break. I'm a crummy clerk. It's not like I had any say in the decisions."

"Sorry, sir, but . . ."

"It's not like I'm on official business. I'm trying to get to my sister's wedding."

The attendant hesitated.

"Look, I'd like to help you, but if the home office found out we sold gas to a government employee, they'd pull our franchise."

"Nobody would have to know. Just

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look the other way for a few minutes and I'll pump it myself."

The man shook his head.

"Sorry, I can't risk it."

"I'll give you $50 for half a tank of . . ."

But the attendant was gone.

Julian heaved a sigh and got back into his car. Once he left the station, though, his hangdog mask slipped away.

Things were going well with the fuel boycott. It had been three weeks since he had had to report a station for breaking the rules. He checked his list for the location of the next station to check out.

The mercenary was wearing a jungle camouflage kill-suit. The hammock he was sprawled in was also jungle camouflage, as was the floppy brimmed hat currently obscuring his face as a sunscreen. He was snoring softly, seemingly oblivious to the insects buzzing around him.

"Hey Sarge!"

The slumbering figure didn't move.

"Hey Sarge!" the young private repeated without coming closer. Even though he was new, he wasn't dumb enough to try to wake the sleeping mercenary by shaking him.

"What is it, Turner?" his voice had the tolerant tone of one dealing with a whining child.

"The tank. You know, the one the detectors have been tracking for the last five hours? You said to wake you up if it got within 500 meters. Well, it's here."

"Okay, you woke me up. Now let me go back to sleep. I'm still a little rocky from going into town last night."

The private fidgeted.

"But aren't we going to do anything?"

"Why should we? They'll never find us. Believe in your infrared screens, my son, believe."

He was starting to drift off to sleep again. The private persisted.

"But Sarge! I . . . uh . . . well I thought we might . . . well, my performance review's coming up next week."

"Qualifying, huh? Well, don't worry. I'll give you my recommendation."

"I know but I thought . . . well . . . you know how much more they notice your record if you've seen combat."

The sergeant sighed.

"All right. Is it rigged for quartz beams?"

"The scanners say no."

"Is Betsy tracking it."

"Seems to be. Shall I . . ."

"Don't bother, I'll get it."

Without raising his hat to look, the sergeant extended a leg off the hammock. The far end of his hammock was anchored on a complex mass of machinery, also covered with camouflaging. His questing toe found the firing button, which he prodded firmly. The machine hummed to life, and from its depths a beam darted out to

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be answered by the chill whimp of an explosion in the distance.

The private was impressed.

"Wow, hey, thanks Sarge."

"Don't mention it, kid."

"Say, uh, Sarge?"

"What is it, Turner?"

"Shouldn't we do something about the infantry support?"

"Are they coming this way?"

"No, it looks like they're headed back to camp, but shouldn't we . . ."

"Look, kid" the Sergeant was drifting off again. "Lemme give you a little advice about those performance reviews. You don't want to load too much stuff onto 'em. The personnel folk might get the idea it's too easy."

That evening the news on the Corporate Wars was the news itself. It seemed some underling at the FCC had appeared on a talk show and criticized the lack of impartiality shown by the media in their reporting on the Corporate Wars.

News commentators all across the globe pounced on that item as if they had never had anything to talk about before. They talked about freedom of speech. They talked about attempted government control of the media. They talked about how even public service corporations like the media were not safe from the clumsy iron fist of government intervention.

But one and all, they angrily defended their coverage of the Corporate Wars. The reason, they said, that there were so few reports viewing the Government troop efforts in a favorable light was that there was little if anything favorable to be said for their unbroken record of failures.

This was followed by a capsule summary of the Wars since the government stepped in. Some television channels did a half-hour special on the ineptitude of the Government efforts. Some newspapers ran an entire supplement, some bitter, some sarcastic, but all pointing out the dismal incompetence displayed by the governments.

The man from the FCC was dismissed from his post.

The blood-warm waters of the Brazilian river were a welcome change from the deadly iciness of the Atlantic. The two frogmen, nearly invisible in their camouflage kill-suits and bubbleless rebreather units, were extremely happy with the new loan labor program between the Corporate mercenaries.

One of the men spotted a turtle and tapped the other's arm, gesturing for him to circle around and assist in its capture. His partner shook his head. This might have the trappings of a vacation, but they were still working. They were here on assignment and they had a job to do. The two men settled back in the weeds on the river bottom and waited.

It was oven-hot in the armor encased boat. The Greek officer in command mopped his brow and spoke in angry undertones to the men with him in the craft. It was hot, but this time

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there would be no mistakes. He peered out of the gunslit at the passing shore as the boat whispered soundlessly upstream.

This time they had the bastards cold. He had the best men and the latest equipment on this mission, and a confirmed target to work with. This time it would be the laughing mercenaries who fell.

"Hello the boats?"

The men froze and looked at each other as the amplified voice echoed over the river.

"Yoo-hoo! We know you're in there."

The officer signaled frantically. One of his men took over the controls of the automount machine gun and peered into the periscope. The officer put his mouth near the gunslit, taking care to stand to one side of view.

"What do you want?"

"Before you guys start blasting away, you should know we have some people from the World Press out here with us."

The officer clenched his fist in frustration. He shot a glance at his infrared sonar man who shrugged helplessly, there was no way he could sort out which blips were soldiers and which were reporters.

"We were just wondering" the voice continued "if you were willing to be captured or if we're going to have to kill you?"

The officer could see it all now. The lead on the target had been bait for a trap. The mercenaries were going to win again. Well, not this time. This boat had the latest armor and weaponry. They weren't going to surrender without a fight.

"You go to hell!" he screamed and shut the gun slit.

The mercenary on shore turned to the reporters and shrugged.

"You'd better get your heads down."

With that, he triggered the remote-control detonator switch on his control box, and the frogmen-planted charges removed the three boats from the scene.

The mercenary doubled over, gasping from the agony of his wounds. The dark African sky growled a response as lightening danced in the distance. He glanced up at it through a pink veil of pain.

Damn Africa! He should have never agreed to this transfer.

He gripped his knife again and resumed his task. Moving with the exaggerated precision of a drunk, he cut another square of sod from the ground and set it neatly next to the others.

Stupid! Okay, so he had gotten lost. It happens. But damn it, it wasn't his kind of terrain.

He sank the knife viciously into the ground and paused as a wave of pain washed over him from the sudden effort.

Walking into an enemy patrol—that was unforgivably careless but he had been so relieved to hear voices.

He glanced at the sky again. He

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was running out of time. He picked up his rifle and started scraping up handfuls of dirt from the cleared area.

Well, at least he got 'em. He was still one of the best in the world at close, fast pistol work, but there had been so many.

He sagged forward again as pain flooded his mind. He was wounded in at least four places. Badly wounded. He hadn't looked to see how badly for fear he would simply give up and stop moving.

He eased himself forward until he was sitting in the shallow depression, legs straight in front of him. Laying his rifle beside down, he began lifting the pieces of sod and placing them on his feet and legs, forming a solid carpet again.

His head swam with pain. When he had gotten lost, his chances of survival had been low. Now they were zero.

But he had gotten them all. He clung to that as he worked, lying now and covering his bloody chest.

And by God, they weren't going to have the satisfaction of finding his body. The coming rain would wash away his trail of blood and weld the sod together again.

If they ever claimed a mercenary kill, it was going to be because they earned it and not because he had been stupid enough to get lost.

The rain was starting to fall as he lifted the last piece of sod in place over his face and shoulders.

Tidwell frowned as he scanned the bar. Damn! Where was Clancy? This was the fourth bar he had been in looking for his drinking partner. It wasn't like Clancy to be this elusive.

He started to leave, then a figure caught his eye. Was it . . . it was! Clancy! Tidwell wondered why he hadn't seen his friend in his earlier scan, then realized with a start that this was the first time he had ever seen Clancy's back.

"Good news, Clancy!" he announced dropping into a vacant seat at the table.

"Oh, hi Steve!"

"It's been finalized! A fat percent increase for fighting the government's boy scouts! Is that a gift?"

Clancy mumbled something.

"How's that again?"

"I said that's terrific."

Tidwell cocked a sharp eye at his friend.

"You all right, Clancy?"

"Me? Sure, why?"

"I dunno. You seem to be taking the news pretty calmly. The only times I've seen you act calm if there was any other option was when you were drunk, thinking deep thoughts, negotiating a contract, or all three."

His gentle prodding was rewarded

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by a wry smile from his friend.

"Guilty as charged, Steve."

"Which?"

"Well, I haven't been offered another contract if that's what's bothering you. As for the other two, I've been drinking a little and thinking a lot."

Tidwell signaled for a round of drinks.

"That can be a dangerous combination, Clancy. Do you want to talk it out?"

Clancy leaned back, sipping at the remnants of his drink.

"How would you say the war's going, Steve?"

"Well . . ." Tidwell scowled in mock consideration. "It's my studied and learned opinion that we're kicking the hell out of them."

"And you think that's good?"

"What do you mean, 'do I think that's good?' That's what we're getting paid to do isn't it?"

"Let me put it differently. Do you think we'll win?"

"You said it yourself, there's no contest! They can't even find us unless we want 'em to, and we only want 'em

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to when we're sure we'll win. We may not be able to win the war, but we can run 'em in circles until they quit. The worse we could get out of it is a draw."

"Then what?"

"Huh?"

"I said then what? What happens when the governments back down?"

Tidwell lapsed into thought, only to be interrupted by the arrival of their drinks.

"I really don't know, Clancy." Tidwell resumed after the waitress retreated. "I've never really thought that far ahead."

"Well maybe you'd better start. First off, it won't be a draw from the government's viewpoint. Either they win it, or they've lost. They've issued orders, made laws, whatever, that the corporations have refused to obey. Right now, their armies are trying to enforce those orders. If they can't enforce it, they're dead. Any governing body that can't enforce its orders loses the ability to issue orders."

"Then who would . . ."

"The corporations, that's who. They're the ones with the power now, military as well as economic."

"So what? We've picked the right side."

"Have we? Steve, would you really want to live in a world controlled by the corporations?"

Tidwell shrugged and sipped his drink. He was getting a bit annoyed.

"Frankly, I don't see that it would be much different then the world we're in right now."

"Controls, Steve!" Clancy was leaning forward now.

"If the governments lose the war, there will only be the corporations, one power with no counter balance, no court of appeals. If you get blacklisted by the corporations, you don't work, period!"

Tidwell shook his head.

"That's too heavy for me, Clancy. Like I told you before, I'm just a soldier, and I don't . . ."

"Bullshit!" Clancy was looming over Tidwell in his anger. "I'm just a soldier . . . I'm just a housewife . . . I'm just an executive . . . I'm just a kid . . . Bullshit! Nobody's responsible for anything. Everybody's just earning a living, just following orders, just looking out for themselves. I'm telling you, Steve, unless people stop taking the easy route; unless we start thinking instead of letting other people think for us; unless we do it now, we may not ever get a chance to think!"

"If you are quite through, Mister Clancy . . ." their eyes glared into each other. "It's too late for all that crap. Too late. The governments are finished. The corporations are going to get a chance at running the world."

"I don't think it's going to be all that great a world, Steve."

"We'll see, buddy," Tidwell said. Then he smiled, slowly. "If we don't like it . . ."

"Yeah?"

"We're soldiers, aren't we? There'll be work for us to do." ■

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A Calendar of Upcoming Events

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through August
LOVELIGHT—a laser musical at the Charles Hayden Planetarium, Museum of Science, Boston, MA. Display of laser light, color and music to form a story. Tickets are $3. For times and ticket information call 617-723-4586.

13-14 August
Star Trek Mini-Con at the Playboy Towers Hotel, 163 East Walton, Chicago. For further information, contact: Queen to Queen's Three, 1723 N. Menard, Chicago, IL 60639

26-28 August
BUBONICON 9 (New Mexico Regional SF Conference) at Ramada Inn East, Albuquerque, NM. Guest of Honor–Gordon Eklund. Registration–$4 until 1 August, $5 thereafter. *Info: P.O. Box 13282, Albuquerque,* NM 87112.

26-28 August
B'HAMACON (Deep South SF Conference 15) at Parliament House, Birmingham, AL. Guest of Honor–Michael Bishop, Fan Guests of Honor–Dena and Charles Brown. Registration $5. Info: Penny Frierson, 3705 Woodvale Road, Birmingham, AL 35223.

18-20 October
AAS/AIAA Conference on Space Industrialization—Living and Working in the High Frontier. Broad-based solutions to the subject of space *commercialization in the San Francisco* Bay area. Papers—technical, space law, space community planning, psycho-social considerations for space communities, economic re*alities of space. Info: Paul L. Siegler,* General Chairman, 4151 Middlefield, Palo Alto, CA 94303.

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30 August-4 September 1978
IGUANACON (36th WORLD SCIENCE FICTION CONVENTION) at Hyatt Regency and Adams Hotels, Phoenix, AZ. Guest of Honor–Harlan Ellison, Fan Guest of Honor–Bill Bowers, Toastmaster–F.M. Busby. Talks, panels, films, masquerades, art show are all included as the SF world gathers. The Hugos (SF Achievement Awards) will be presented as will be the John W. Campbell Award for Best New Writer. Membership rates: $15 until 31 December 1977, $20 until 31 July 1978, *$25 thereafter and at the door. Info:* P.O. Box 1072, Phoenix, AZ 85001.

—ANTHONY LEWIS

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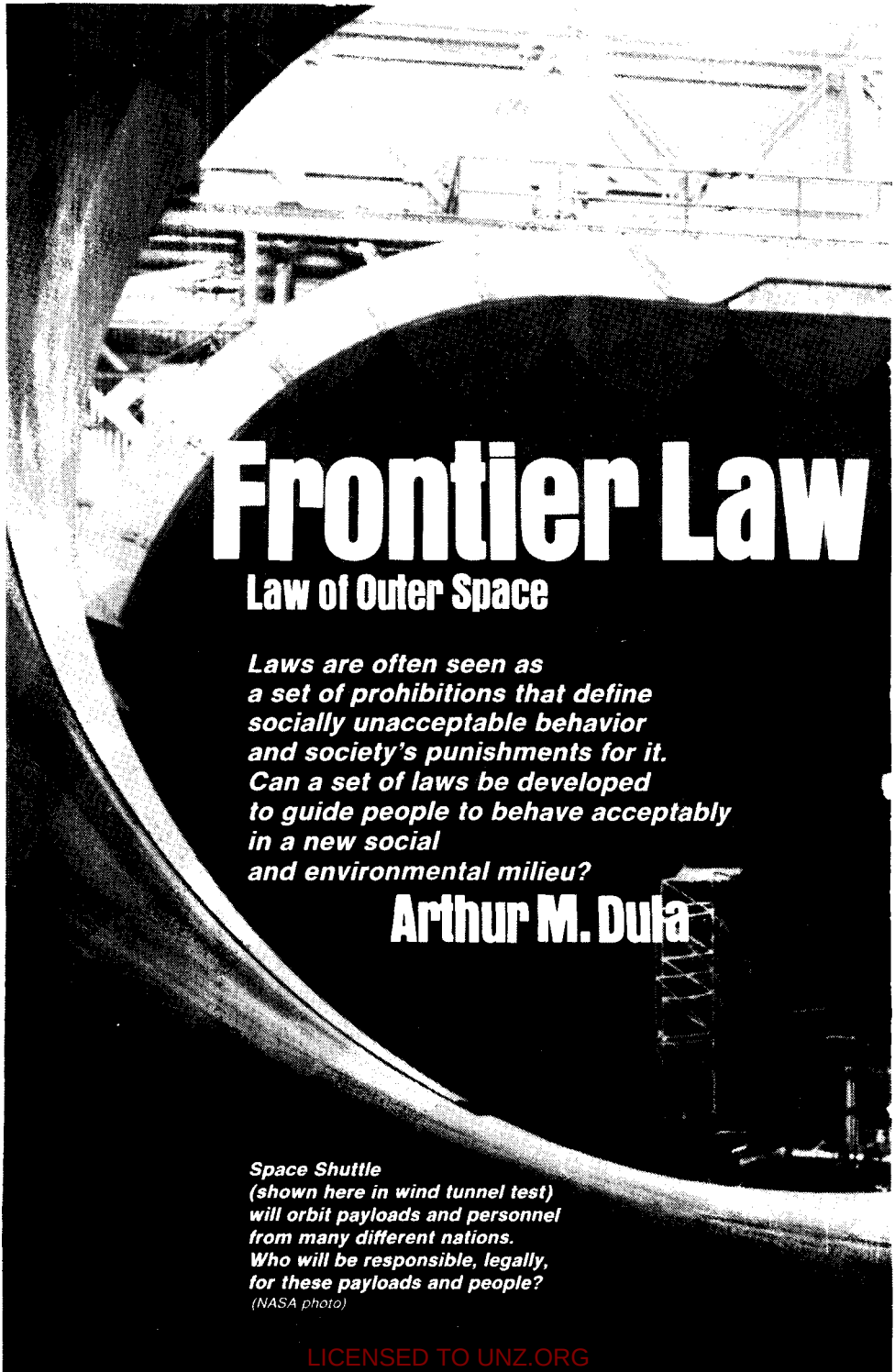

Frontier Law

Law of Outer Space

Laws are often seen as a set of prohibitions that define socially unacceptable behavior and society's punishments for it. Can a set of laws be developed to guide people to behave acceptably in a new social and environmental milieu?

Arthur M. Dula

Space Shuttle (shown here in wind tunnel test) will orbit payloads and personnel from many different nations. Who will be responsible, legally, for these payloads and people? (NASA photo)

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The emancipation of man from his Earth came with the invention of the artificial satellite. The proliferation of satellites has warranted the creation of a new legal concept—the regulation of man's actions in space. Lawyers of many nations have taken up the challenge of developing rules of law to govern these endeavors.

The space age is now nineteen years old and has progressed from a small payload in orbit to systematic exploration of the solar system, from one Russian once around the Earth to twelve Americans on the Moon. The United States and Russia have spent billions of dollars learning to live and work in space. Paralleling this progress, space law has evolved into general and specific treaties. These treaties set forth both principles of law governing man's space activities and specific stipulations of liability for damage caused by space objects and for the return of distressed astronauts. The field's literature is vast, growing, and international. Institutes of space law have been established at several universities and there is even a *Journal of Space Law*. This rapid development of space jurisprudence lays a broad theoretical groundwork for a regime of law governing the much wider sphere of man's activities which will occur in space during the 1980-2000 time period.

Space exploration and research in the last decade have been motivated largely by political or intellectual purposes. Man has learned a great deal about the unknown and is now putting some of that new knowledge and ability to use. Communications, weather, navigation, and Earth resource satellites make real economic profits which contribute directly or indirectly to the gross national product. Intelligence gathered by reconnaissance satellites allows us to live in greater security with less chance of accidental war. By 1980 the National Space Transportation System, better known as the "Space Shuttle," will make industry a partner in space research. The ability to carry large payloads to orbit routinely and to reuse spacecraft will allow industrial research and manufacturing in space. Many chemical and manufacturing processes which are difficult or impossible to perform on Earth can be practiced easily and economically in the weightless environment of space. Space solar power satellites linked to Earth by microwaves create the possibility of supplying large amounts of solar power in the form of electricity to meet anticipated energy demand of the United States by the turn of the century. It may even be economically feasible to build permanent manned bases on the Moon and in orbit.

All of these advances in space technology will involve many people living and working in space. When few people are involved in a wholly governmental research program, there is no pressing need for strict legal regulation of space activity. Once space begins to produce a profit and private enterprise starts utilizing it as a unique resource, many difficult prob-

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lems of jurisdiction and substantive law will arise to flesh out the theory that is today's space law. By studying the probable developments in the space program it is possible to predict many of the problems that must be solved by space law.

Space law provides a framework for regulation of man's activity in space. Its historical roots run deep into property law and grow out of customary international law established de facto by the space powers since 1958. Statutory space law is entirely the law of multilateral and bilateral treaties originating mainly in the United Nations, especially the multilateral treaties emanating from the Committee on International Cooperation in the Peaceful Uses of Outer Space.

In ancient law ownership of land implied ownership of all the space above that land outward to the sphere of the fixed stars. The Roman Law of maxim *cujus est solum ejus est usque ad coelium*, establishing an indefinite upward extent of ownership over land, was cited with approval by Blackstone:

"Land hath also, in its legal significance, an indefinite extent, upwards as well as downwards."

Grotius, however, claimed there was a "freedom of space at an altitude beyond the range of the hunter's weapon." This concept recognized a very real fact of national jurisdiction. A country cannot effectively control an area where it has no power.

For many centuries nations had no need to go beyond simple maxims to define rights to air space. It was clear that a state might claim ownership, but could not exercise actual jurisdiction over air space. The Earth's rotation and movement about the Sun rendered a literal interpretation of unlimited, ever changing, upward ownership absurd. As Grotius realized, somewhere between the surface of the Earth and the stars, ownership ended even in theory. There was no immediate need to determine where until the invention of the airplane.

Operation of early aircraft clearly established that private ownership of land granted rights upward only as far as the owner could make some beneficial use of the adjacent air space; as, for example, by building a tower or erecting a building. National jurisdiction, however, extended beyond this limit. Jurisdiction over air space was limited in practice only by the reach of a nation's weapons, as the United States learned from the U-2 incident in the early 1960s. Present international law recognizes the United States' right to maintain air defense identification zones (ADIZ) extending well beyond the territorial limits of its national sovereignty. Taken literally, present federal air regulations provide no upper boundary to federal jurisdiction over air space above American territory.

Customary international law also recognizes the right of nations to exercise personal jurisdiction over their nationals wherever they may be found and to maintain jurisdiction over air-

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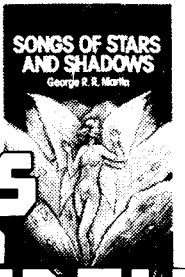
SONGS OF STARS AND SHADOWS



"Each of his stories is new and unique... all the old truths of the human condition are tested afresh."
—Ben Bova

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craft and ships traversing the high seas, an area not subject to any claim of national sovereignty. Multinational treaties governing the actions of states in remote areas, notably Antarctica, established a precedent for geographic zones which are accessible to states, but not subject to any claim of sovereignty or any other form of national appropriation. Although only signatory states are bound by this rule of nonappropriation and nonsignatory states may assert adverse claims of national sovereignty over areas covered by the treaty, such treaties do provide a persuasive source of international law. Present space law is tied to structured international law through custom and treaty.

Rules of international law can be created by unilateral action of states. Such action must be sufficiently public to give other states notice of the nature of the proposed rule and still acceptable enough not to provoke a general adverse reaction. Specifically, at least three elements must be present for the unilateral action of a state to create a rule of international law:

The state must take some public action to promulgate the rule; the state must give notice that it intends to continue to act in this manner; and other states must behave in such a way as to endorse the action and rule.

Both the United States and the Soviet Union have created customary space law. The Soviet Union unilaterally acted to promulgate a rule that

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national jurisdiction does not extend into space by launching the first artificial Earth satellite and allowing it to pass over American territory. Technically this was an invasion of the air space of the United States. Rather than protesting its invasion, the United States responded to the Russian action by beginning the "space race." This response in kind endorsed the Soviet position and soon dozens and then hundreds of satellites were routinely passing over every country on Earth without challenge. This rule has been accepted unanimously by both space and nonspace powers and today is a basic premise of international space law.

By the early 1960s, both the United States and the Soviet Union began to use photographic and electronic reconnaissance satellites to gather military intelligence. The United States also began an ambitious program designed to gather resource data about the entire Earth through remote sensing from space satellites. These actions were not universally endorsed by other states initially and furnish an excellent example of how customary international law grows in response to international reaction. At first the Soviet Union publicly stated that the gathering of military intelligence by satellite was "espionage" and "the use of artificial satellites for the collection of intelligence information . . . is incompatible with the objectives of mankind in its conquest of outer space." They even went so far as to launch and test a series of "killer" satellites designed to seek out and destroy other satellites.

Some less developed nations objected to the advantage gained by technically sophisticated countries through the analysis of Earth resource data gathered by satellite showing previously unknown mineral deposits and other sources of national wealth. In the United States, NASA responded by making all Earth resource satellite photographs available to the public at a nominal charge. The agency also required experimenters engaging in multispectral resource imaging on Skylab to obtain permission from the surveyed states prior to their photography from orbit. As a result of this action, resource imaging of the Earth from space has become an accepted method of inventorying the world's resources. Several governments have made specific arrangements by means of bilateral treaties with the United States to transfer this information or construct ground stations capable of directly acquiring and displaying the Earth resource data. Such treaties provide developing nations, e.g. Brazil and Iran, with technical assistance required to make best use of Earth resource data collected by their national stations and thus promote more efficient and orderly development of the nation's resources. On the military front, both the United States and Soviet Union have accepted the validity of space observation as a means of providing the verification required by arms control and disarmament treaties. By formally

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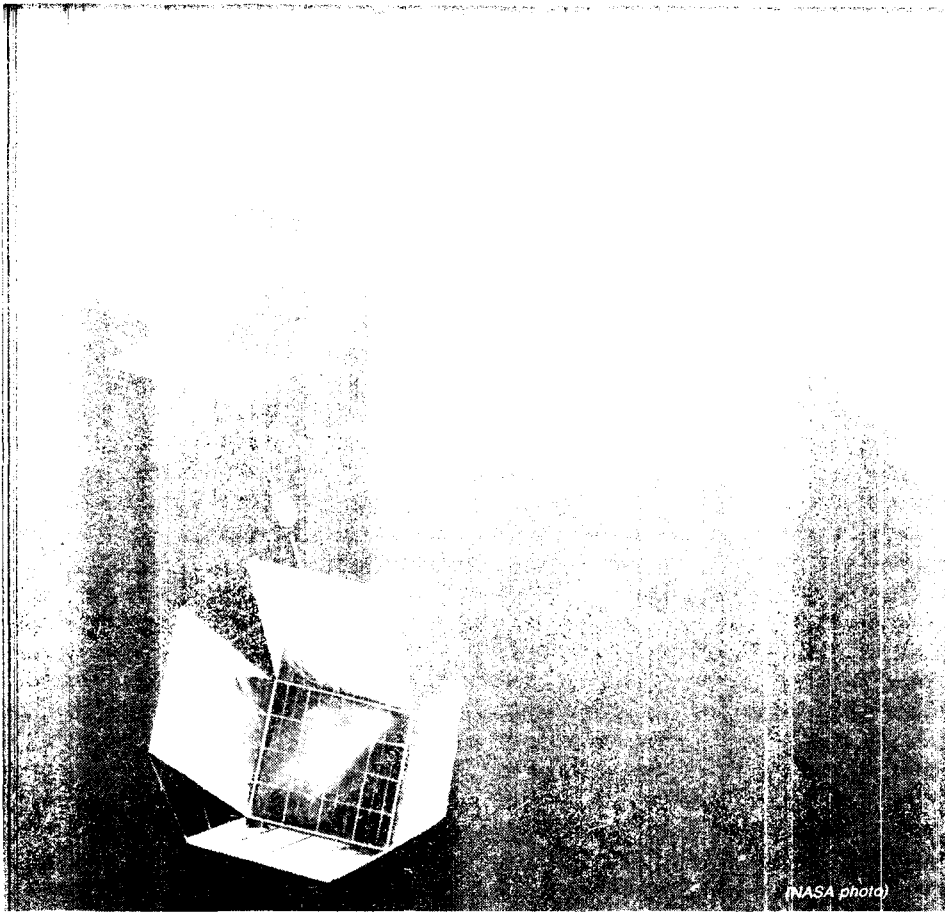

If solar power satellites are developed to beam energy to Earth, will they "belong" to the companies that build them, to the nations that provided the boosters, or to some international agency?

agreeing not to interfere with satellites used for such verification, clear international rules have evolved out of the earlier disputed customs and uncertainty has been reduced in this area of international law.

Customary space law initiated the principle of noninterference with space objects launched by the states and began the rule that mutual assistance was to be rendered whenever possible in case of emergency or distress. Noninterference ranges from the courtesy of insuring that radio signals from different space probes will not jam each other, to the necessity of insuring that all space objects are placed in orbits that minimize the chance of collision between them. An example of the rule of mutual assis-

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tance was provided by the Soviet Union's offer of the use of its tracking ships when Apollo 13 was damaged by an explosion on its way to the Moon.

The customary law of space, being created by the unilateral action of states and ratified by the acquiescence of other states, lacks the precision and commitment required to form a firm foundation of space law. The United Nations, especially the Committee on International Cooperation and Peaceful Use of Outer Space, has worked to mold customary space law and those general rules of international law included in the United Nations charter into a treaty of principles. The provisions of this general treaty in turn become the detailed subject of specific agreements governing the relations between states in space. By this process space law grows more definite and exerts a greater obligation on states as more is learned about the space environment and what rules are best adapted to govern man's activities in it.

Just as the first missiles to launch Earth satellites were modified ICBMs, military use of space was the subject of the first treaty governing the conduct of states in space. The 1963 Nuclear Test Ban Treaty specifically prohibited testing of nuclear weapons in outer space. Before the end of 1963, the United Nations' General Assembly unanimously adopted a Declaration of Legal Principles "governing the activities of states in the exploration and use of outer space." This Declaration set forth nine general principles which would guide states in their space activities and form a basis for later treaties. In 1967, after a considerable amount of dispute on certain key issues concerning the right of nongovernmental entities to use outer space, the United States, Soviet Union, and United Kingdom joined in a multilateral "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies." This treaty comprises seventeen articles.

Over ninety countries have ratified this treaty since it became effective in the United States in 1967. Because it is a treaty of principles, rather than a treaty creating express rights and obligations, it acts only as a guide for the ratifying states to aid their formulation of national policy and to provide a firm base for the development of express treaties implementing its various principles in rules of positive international law.

Evolution of the state's responsibility for actions of its citizens in space deserves explanation. The first draft of the 1967 treaty was proposed by the Soviet Union in 1962 and clearly indicated the USSR's belief that profit-making private companies should never be allowed to operate in space. The United States rejected this clear attempt to ban free enterprise from space, both formally in the United Nations and practically by creating a corporation "not an agency or establishment of the United States government" whose purpose was to establish

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a commercial communication satellite system. COMSAT shares went on sale to the American public in 1962, and its enormous technical and economic success strongly reinforced America's position that private enterprise should be encouraged to invest and operate in space.

In 1963 the United Nations adopted a compromise resolution specifically permitting activities of private companies in space. The resolution also required that the state concerned authorize the private activity and exercise "international responsibility" for and "continuing supervision" over it. The Soviet Union accepted this compromise and it is reflected in the language of the 1967 Treaty of Principles.

G. P. Zhurakhov wrote in 1974 that the Soviet Union's position on this matter was dictated by its "justified fear" that granting freedom of action to Western private industry in outer space would encourage "the kind of activity . . . correctly characterized as piracy." At the same time, however, the Soviet Union conceded that the United States had the right to authorize the activities of private companies in outer space.

This dispute reflects the deep hostility and suspicion with which the Soviet Union views progress of the American free enterprise system into space. When the present general treaty evolves into a specific treaty on the Moon, covering the use of its natural resources, we can again expect to find the United States and the Soviet Union locked in dispute over whether private companies have the right to extract and use lunar minerals. Indeed, the present Soviet draft of the proposed lunar treaty goes to great length to prevent private ownership of materials extracted from the Moon.

Two of the general principles stated in the 1967 treaty—aid and rescue of astronauts and the liability for damage caused by space objects, have become the subject of specific treaties. These implementing treaties further develop and give concrete expression to the duties and obligations imposed on the contracting states. In 1968 agreement was reached establishing a duty to take "all possible steps" to rescue and render assistance to distressed astronauts. The treaty institutes a procedure for notification of the launching state and for return of property and personnel entering a state's jurisdiction as a result of "accident, distress, emergency, or unintended landing." All expenses incurred as a result of such rescue and return must be paid by the launching authority. This treaty, against the desires of the Soviet Union, leaves open the possibility of granting political asylum to a cosmonaut who *intentionally* causes his spacecraft to land in another state and does not desire personal repatriation.

In 1972 the major space powers agreed on a convention covering international liability for damage caused by space objects. The convention establishes a standard of "absolute liability," requiring a launching state to

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pay compensation for damage caused by its space object on the surface of the Earth or to an aircraft in flight. If the damage is done in space or to another spacecraft, the launching state is liable only if the damage is "due to its fault or the fault of persons for whom it is responsible." The treaty establishes a number of rules distributing liability between states engaged in joint space ventures. Generally, each such state is jointly and severally liable for the entire compensation. A one year statute of limitations for presenting a claim runs from the time of the damage or such time as the damage should have been known had the state exercised due diligence. Finally the convention outlines a clear procedure for presenting a claim through diplomatic negotiations and a claim commission, specifically providing that action may be brought prior to the exhaustion of local remedies.

Draft treaties are presently in negotiation to formalize international registration of space objects and to deal with legal problems presented by exploration and development of the Moon and lunar resources. As man's activities in space expand, the general principles of the 1967 treaty will be enacted into positive international law by other more specific treaties. The form of these treaties will depend on the nature of future space activities and the problems they present.

Every lawyer knows the law's meaning depends on definitions of words that comprise it. Several important terms unique to space law lack clearly established meanings in international law and none are defined by the treaties:

What is a "celestial body?" Clearly the Moon and planets qualify, but what about asteroids, comets, meteors, and dust particles? This question is important because even a small asteroid made of iron could supply the steel requirements of the United States for centuries.

What is a "weapon of mass destruction?" Nuclear weapons are specifically forbidden in space, but many experts believe the only way to build an efficient interplanetary spacecraft is to use nuclear rockets which are as powerful as nuclear bombs. The explosion of a fully fueled Saturn V rocket would destroy at least three square miles. Does this make the Saturn V a "weapon of mass destruction?" Perhaps the term "weapon" implies the intention that the power involved be used aggressively.

On the other hand, these terms and other undefined phrases give the 1967 treaty a comfortable looseness that may be an advantage in adapting it to future space activities. Possibly authentic or judicial interpretation will define these terms with precision when the needs of space law become clearer. Later treaties may provide better definitions. Certainly much careful legal analysis will be invested over the next few decades in weighing these.

Fundamental to understanding and applying space law is the ability to

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know where it should be enforced. Unfortunately, recognized authorities disagree over where "space" starts. Some argue that space begins beyond the "effective atmosphere." The United States has recognized that a "space flight" took place at an altitude of 47 miles in the X-15 rocket plane. The pilot of the plane was awarded an astronaut rating for the flight. This altitude is far above the limit of effective aerodynamic flight. Other authorities maintain that space begins some 75 to 100 miles above the Earth's surface. This is the region where a satellite may make one or more orbits without being slowed appreciably by the atmosphere. Because the atmosphere gradually gives way to space without any sharp line of demarcation, it is clear that only a negotiated agreement can precisely define the boundary of space for legal purposes. To date no such agreement has been reached.

The 1967 treaty of principles states that outer space is not subject to national appropriation by "occupation" or any other means. At the same time, certain highly desirable portions of space around the Earth are in limited supply. All long-range communication satellites must occupy "geosynchronous" orbits. Geosynchronous orbit is a specific portion of space 22,800 miles above the equator around the entire Earth. For technical reasons communication satellites must be spaced at least two degrees apart. Thus there are only 180 orbit positions available for use by communication satellites. The number of optimum positions between any given countries is far less than this total.

At the present time orbit allocation for geosynchronous orbit presents no great legal difficulty. All usable spaces have not yet been occupied and international telecommunication organizations have developed a customary method of assigning orbit positions. However, several of the areas above the Atlantic and Pacific Oceans best suited to allow satellite relay of telephone and television signals between America, Europe, and the Far East are very nearly full. This crowding of preferred locations presents a very real problem. Communication density is growing constantly and these orbit positions are economically valuable to communication companies. The 1967 treaty states that appropriation of space should not be allowed, yet by occupying scarce geosynchronous orbit positions, communication satellites appropriate these positions de facto to the exclusion of all other users. The benefits derived from this use and appropriation flow not to all people, as required by the same treaty, but to the states or corporations who own the satellites. Because of the potential conflict with the 1967 treaty of principles and the conflicting economic and political interests involved in equitably assigning geosynchronous orbit positions, orbit allocation presents an immediate and difficult space law problem.

By the early 1980s the United States Space Shuttle and the Euro-

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pean Space Lab will jointly provide a transportation system capable of routinely carrying industrial experiments and production facilities into space. This involvement of the private sector in space activity presents an interesting challenge to space law.

The 1967 treaty provides that the jurisdiction of the launching state follows a space object into orbit and that ownership is not affected by travel to space or subsequent return to Earth. Industrial users of the Space Shuttle system must know what jurisdiction will apply to them for the purpose of taxation before they can make meaningful economic plans to use this new capability. Of equal importance is the right of a private corporation to the patent and trade secret rights covering discoveries it makes while doing research in space. At present all parties flying experiments with NASA must make public disclosure of the purpose of the experiment and disseminate its results to any interested party. Additionally, the patent rights to any inventions made during the experiment must be shared with the government. A realignment of relationships between the government and private industry must take place before industry will be willing to invest the large amounts of money required to do research or production in space. Although we are only a few years away from beginning space research on the Shuttle, NASA has not developed a set of rules which would allow private industry to retain the fruits of its investment in space research.

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The deployment of the Space Shuttle begins the era of space industrialization some economists feel will be called the "third industrial revolution". Boeing Aerospace, Arthur D. Little, Inc., and several other corporations have proposed space power satellites that could dependably supply very large amounts of clean electric power to the Earth. Construction of these space powerhouses would require the establishment of a large industrial capability in Earth orbit and on the Moon. The Arthur D. Little company has studied a proposed solar power satellite six miles long by four miles wide which would be fueled by sunlight. Such a powerhouse would deliver 10,000 megawatts of electricity to the Earth, several times the

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amount of power delivered by a large nuclear power plant. Such power satellites are technically possible and initial cost analysis suggests they can be economically feasible despite enormous initial capital costs. Sunlight is free and the environmental impact of that system would be minimal.

If such space powerhouses are built, costs dictate that they largely be constructed in space of material mined from the Moon. This prospect presents space law with several interesting problems. The 1967 treaty provides that the Moon is not subject to national appropriation by any means. Yet millions of tons of lunar material would have to be mined and refined to construct these solar power satellites. The thousands of space workers in permanent orbital and lunar settlements required to build the power satellites also pose problems. Dr. Gerard O'Neill of Princeton University has suggested that the best way to economically produce these satellites would be to build large space colonies at the distance of the Moon's orbit. Lunar material would be sent to these colonies and the colonies would make their living by constructing solar power satellites. The satellites would then be moved to geosynchronous orbit to supply energy to Earth.

Once a permanent settlement is established off of Earth it will only be a matter of time until it is self-sufficient and wishes to take some part in determining its own affairs. Since such a colony would be constructed mainly of lunar material, who would have jurisdiction over it? Can jurisdiction attach by accretion?

This is not idle speculation. A 1976 report from the Harvard Graduate School of Business has estimated that the first solar power satellite could be delivering power to Earth by 1991 and that 100 of these satellites could provide the entire energy requirements of the United States in the year 2020. Further, this same report indicated that, if the initial capital could be raised, space solar power satellites could be very profitable. This scenario is no more unlikely to us today than the thought of spending $24 billion to send 12 men to the Moon would have been to the average lawyer in 1950.

The true long term problems facing space law are largely political: the question of weapons in space, the development and exploitation of extraterrestrial mineral resources, and whether or not free enterprise will be able to work effectively in this new economic environment.

Space is so vast and the distance from one celestial body to another so great that the tools man will use to work effectively in space must be very powerful. These tools will have the capacity to create "mass destruction" if they are used improperly. The environment of space lends itself to handling levels of power which cannot be conveniently controlled on the surface of Earth and to the construction of structures far larger than those to which we are accustomed. One of the long term problems of space law lies in determining the difference between

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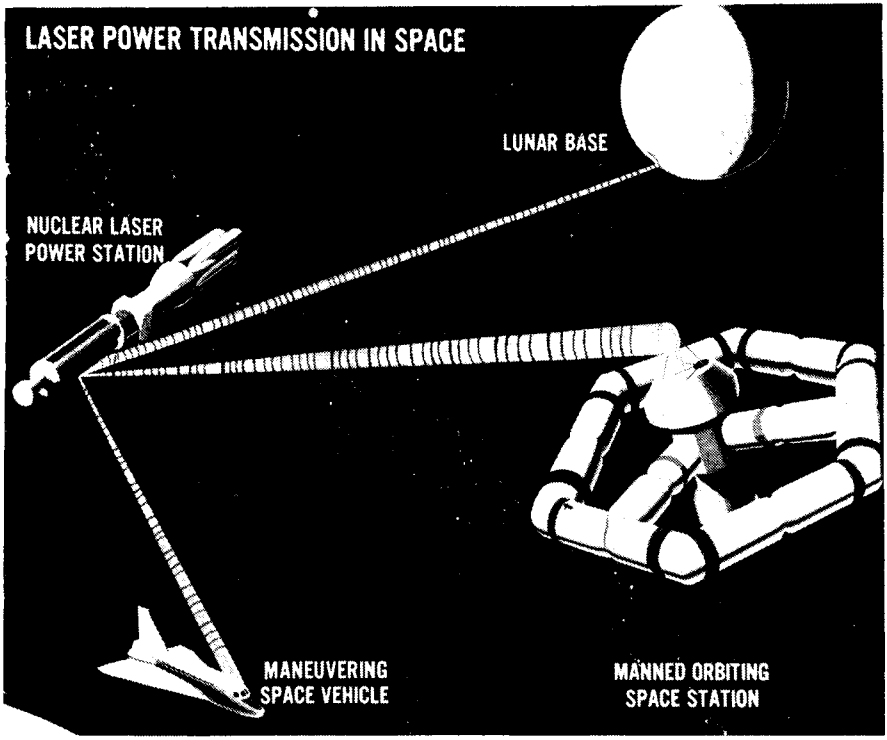

(NASA photo)

When large-scale operations are taking place on the Moon, at the Lagrangian Points (such as L5), and in Near Earth Orbit, where will legal rights and responsibilities lie? Can Socialist nations work together with capitalist corporations on the development of extraterrestrial resources?

a very powerful tool and a weapon of mass destruction whose presence in space will not be tolerated.

Another long term problem facing space law is development of a framework for the exploration and exploitation of extraterrestrial mineral resources. At the present time we live in a world without frontiers. We are becoming more and more aware of the limitations to growth placed on mankind because of his lack of energy, raw materials and living room. Space can provide a new source for each of these requirements. Solar power satellites can provide an uninterruptable flow of energy and the mining of extraterrestrial resources can provide a new source of new raw material. Space can even provide living room

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and the physical and emotional challenge of a frontier for coming generations.

Some experts draw the analogy that the present condition of mankind on Earth is like that of a child just before birth. Conditions are crowded and resources are getting scarce. Projections of the future based on past experience look grim. As one Russian space pioneer put it, "Earth is the cradle of mankind, but man cannot live in the cradle forever."

A continuing question that will face space law in the distant future will be which system of laws will direct the lives and economic production of the people who live in space. At the present time we have two candidates for the position: free enterprise from the United States and central state planning from the Soviet Union. One of the immediate problems of space law is to insure that both of these competing systems get a fair trial as the industrialization of space begins.

The final answer to these questions will, perhaps, be determined by a generation of lawyers who know the Earth as an interesting place to visit. They will present the international law of Earth to their own courts as a foreign law. Hopefully, those courts will find it a persuasive authority for their decisions. ■

Arthur M. Dula's education has equipped him with excellent credentials to pursue his hobby—the space program. With a B.S. degree in chemistry and a law degree, Mr. Dula can readily appreciate the complexities of the new field of space law. He practices patent law in a Houston firm.

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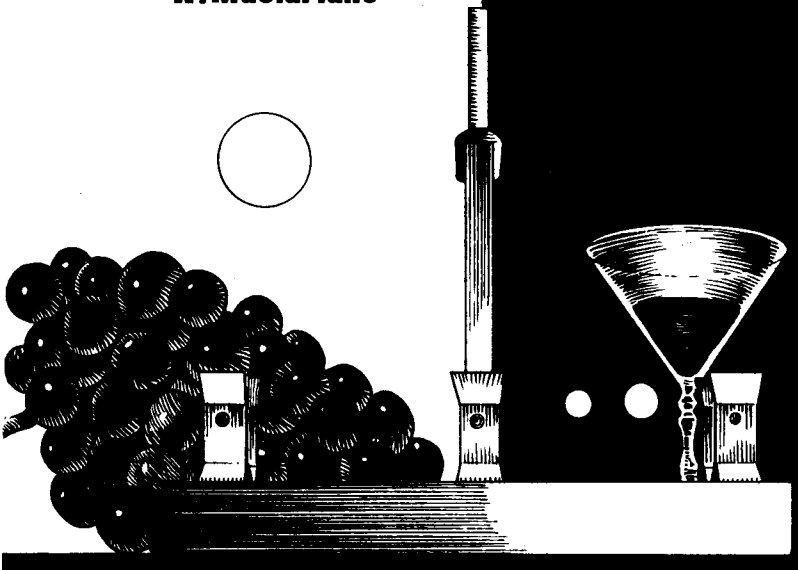
the 63rd of August

"If we had world enough . . ."
OR time.

W. Macfarlane



Jack Gaughan

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When they built the new parking lot, the foot traffic pattern changed and a variety of girls walked past the windows of the physics laboratory. The undergraduates didn't bother Smedley Daingerfield. What kept him in a low-order sweat was their older sisters who put the last kid in first grade, folded their brassieres away in the bottom drawer and swaggered past the windows of the physics lab in search of tall relevance, dark meaning and a handsome life.

He was none of those things and worse, he had no time.

He was a medium-size nuts and bolts physicist instead of a big chalk-talker. He worked at Sam Marcos University, inland and north of San Diego, because he had some ideas he wanted to peedoodle around with, and only a university can afford the equipment anymore. The trouble was, Murtin Spicer let two men go and hired Daingerfield to run the lab courses: mechanics, the properties of matter, heat, sound; light, electricity and magnetism, atomic and nuclear physics. Murt Spicer was full professor, ruggedly handsome and dressed from the pages of Norm Thompson and Eddie Bauer. "Research?" He was standing elegantly by the split-rail fence of the parking lot. He had cold gray eyes and wore a classy $325 sheepskin coat. "Research usually means TV repair." His blonde wife tootled the horn of his yellow Corvette. "Do it at home."

"I'll be dipped," said Smed Daingerfield. "I've been putting in twelve hour days since school started—"

She tapped the horn again. Her name was Sugar Ann, with wide bright eyes and a full lower lip. Murt called out, "All right, all right!" He shrugged. "All right, be sure the decks are cleared for Monday. When the accreditation team moves in, all sunshiney faces, okay? Don't invent sliced bread on our time—I'll give you that idea—all rights belong to Sam Marcos. TGIF—I'm coming!" He grinned his manly white grin and punched Daingerfield's arm and vaulted the rustic fence.

So Smedley Daingerfield started out early the next morning and invented an immovable object, even though he was only an instructor with a masters working on his PhD.

He brooded over bits and pieces, rewired some odds and ends from the storeroom, borrowed instruments down the hall and when everything was patched together, he ate a baloney sandwich. He looked at the palm trees outside tossing their heads in a mild Santa Ana wind, and with true scientific dedication he did not think about Jilli and Judi and Nan. What can you do when there are only twenty-four hours a day? He smeared the mustard blob on his lab coat and licked his finger. Then he scratched his head. Then he shoved in the traditional knife switch.

One of the items on his list of things to do when he had the time was to make a scientific tape recording: a

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rising electronic whine, a bubble machine, Dr. Frankenstein calling for Igor, a pocketa-pocketa noise, all the proper sounds of science.

He wished he had it now because nothing happened. The needles stayed on their pegs, the oscilloscope pattern was painted inside the tube and the wall clock hummed because it didn't know the words. He uncoupled the graviton generator and began to check synchronal frequencies and phase differences from his zero point. So far, the only satisfactory thing about the experiment was the traditional black box he found to put at the focus of the field. It had a lid. Because human beings are built with a compulsion to put something into a box, he put in the pear from his sack lunch, not quite ripe enough to eat. He checked the layout against his logic and pushed in the switch again.

"Am I boiling pennies with acorns and ground-up rat tails in vinegar to turn them to gold?" He absentmindedly tore a piece from the paper bag and ate it. "This is dumb. When I could be out on a picnic with a loaf of bread. And Jilli or Judi or Nan and a bottle of wine." He felt hungry. Pears are deceptive. Maybe it was ripe enough.

The box was unapproachable. As Queen Victoria.

The boiled pennies were too hot to touch. And stayed hot.

Smed Daingerfield had old fashioned red hair, the kind that goes with greeny-brown freckles on a white skin over a boney face, and his eyes were blue when he began on Saturday morning. By Sunday afternoon they were patriotic as the flag. He stirred up coffee in a beaker from time to time, but he was riding the unstoppable wave curl of Now, and when he drank 100 cc of coffee he thought of another thing to try on the box: heat, cold, drills, punches, sledgehammer, acid, and coffee. "And etcetera you redundant idiot," he said.

The box did not move on the table top. It was locked in its relationship with the world, untouchable. He could not move the lab table without tearing it apart. It was two o'clock Sunday morning when he thought of building a lattice outhouse around the immovable object. He stepped back from the completed job late Sunday afternoon and knocked over a beaker of cold coffee. His voice was hoarse when he spoke to greet the giant step forward he had created: "Ratshit, catshit, batshit!" Step sideways? Or oblique? He wanted to consider the pattern whole.

Sometimes he could do this phenomenal thing. One day while he was more or less just standing around, Boolean algebra fell into place like a reconstructed Byzantine mosaic. *APL, A Programming Language* by Kenneth Iverson, turned obviously on its structured merits. And once he saw a whole patterned affair with a girl named Nelli from the first cup of coffee to the slam of the door when she walked out of his life forever, how lucky can you get.

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No pattern this time. No flare of illumination.

He brought his notes up to the minute, 4:36 Sunday afternoon. He stepped into the skeleton box. "Roll program code Maybe," he croaked and threw the knife switch. The instruments had not stirred on Saturday because they were too coarse. Needing the refining influence of a good woman? "Yes indeedy-do," he said and opened the black box.

The pear was gone. A desiccated chip lay in its place. A pear left in Tutankhamen's tomb by a brownbagging mortician would look the same thirty-four centuries later. Somewhere on his tape to make science by, he could cut in a fanfare of doubtful trumpets.

He closed his bleeding eyes. Then he disassembled the box. He wadded the wire for salvage, pulled the hinge-pin to remove the lid, put his toe in the box and pulled up. He stepped on what was left. Outside the laboratory the rattling fronds were frozen and a passing dog stood like a statue, one leg cocked against a palm. He tapped his fingers on the air wall delimited by the 2x2 scantlings he had cobbled together to hold the Mark II wiring. It was like knocking on the wall of a mine tunnel. He was surrounded by miles and miles of solid—time?

The air was getting stale when he opened the switch and stepped out of the phone booth. He pushed the button and the taped voice in his wrist watch said, "The tay-um is fow-wer fifty thu-ree and ten seconds." The wall clock read 4:36, the minute he had thrown the switch. The dog lowered his leg, scratched and trotted off.

No time had passed. He could punch a hole in an hour and pull the hole in after him. This realization was like kissing a five-foot-two electric Amazon smack on the juicy red lips. "Be double dipped," he said.

He took apart the lattice box and put the components back where they came from. He read the graviton generator with everything but a rectal thermometer. It was standard. The synch equipment was stock. With no buggeration, his time capsule was valid as observed. He swept up the broken beaker and washed the others. He was moving like Igor by then, but his heart stumble-thumped when he found his notes open on the table for anyone to see. He burned them and went home to bed.

Daingerfield could never remember what biochemists said, high blood sugar or no blood sugar in the morning, but he was self-programmed to shave and make coffee before he woke up. He scrambled four eggs in crumbled sausage patties and stopped with the spatula in midair. "I'll be dipped," he said. He slid the eggs onto slices of toast, buttered and ketchuped. "Double dipped in a vat." He was coming alive now. He poured another cup of coffee and the past meshed with now. In a voice of wonder he said, "I'll be double dipped in a vat of deep purple puke."

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Archimedes needed a fulcrum and a place to stand with his lever. Daingerfield could move the world with a postcard to the right man. He shuddered. A chill ran down his back at the thought of alerting the wrong men, the "social" scientists, the ones who wiped out cyclamates and said the sky was falling from underarm deodorants. They denied God but believed in saving their neighbors from themselves, a single-level truth for all, and planned obsolescence. His sixteen-year old refrigerator started quietly.

"I can't unopen a can of worms, can I?" No physical fact has been surpressed for long. "How about a successful murder?"

There just wasn't any data. An old friend afflicted with an omnivorous appetite for the printed word once told him there were no undiscovered writers in real life and no unsung singers. "No information," he continued the discussion as he drove to work an hour early in his elderly convertible. "Who needs the secret of Greek fire? With napalm, forget it. On a Stradivarius, is it the 'lost' varnish or 200-plus years of seasoning to make the tone? Prove it." He pulled into a parking space under a new eucalyptus talking to himself. "If Mendel hadn't published in the transactions of the Natural Science society in Brünn, how could three botanists find his experimental data and general theory thirty-four years later? And what have we lost in the paper blizzard today?"

"Good question," said Sugar Ann,

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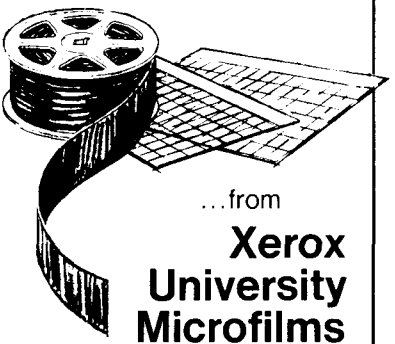

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who walked up to his shabby convertible. "Another is, are you out of your gourd?"

He was not a morning man. His time lag for response was too long. She misread his hesitation and said, "We met at the department boozer when school started, okay? I'm Sugar Ann Spicer. Now pay attention. Murtin is up and down with tummy flu and it's madness for him to get more than twenty seconds away from pottie. You must cover his classes." He said, "Mumph-er." She took it for assent and patted his arm. "Here are the notes. You are a dear, dear person, Smeddy. I must fly to find a cork store." She patted his cheek and turned to the yellow Corvette panting in the background.

Smeddy? Women who promiscuously pat arms denigrate the masculine principle. She might be round and firm and bushy-tailed, but she deserved Murt and likewise. "Look for olive size corks," he called after the Corvette, "Gigantic or Super Colossal!" He grumbled, "That rugged indoorsman stabbed me with four hours of class—suppose I can fake it—" He leafed through the notebook. "Accreditation day!"

Every five years a regional team swoops down to judge the quality of the local product. Jury of your peers. And Murt Spicer had crapped out on him. No time for preparation. Today was the day. "No time," he groaned. No time?

He spun the Mark III wiring around the storeroom like a hyperthyroid spider. The Dean was walking two members of the assessment team beside the palms when Daingerfield carried in the text and notes and threw the knife switch. He cracked an oxygen bottle at the end of his first interior hour and figured an airflow through soda lime to take out the carbon dioxide—when he had time. He prepared the first lecture with painstaking care. The Dean's foot was still in the air when he returned to standard time, so the ratio was extremely large. Another thing to do was find that relationship—when he had time.

A pride of women walked by outside. A gaggle? A wonder of women? Boy, were they ever emancipated! No time, no time, no time.

After the first class, J. B. S. Conkery of Stanford said, "Have you seen the emendation of the Heyl/Chizanowski G value?" And Wilbur Dowling of Harvey Mudd wrote 0.003×10^{-11} nt-m^2/kg^2 on the blackboard and rubbed his nose with the chalk and talked scientific gossip. Old buddies. Very flattering. Daingerfield managed to disappear briefly into the storeroom for a few hours to cram for the next class. He organized a purification system with a battery squirrel-cage blower sucking air through the soda lime pellets and took a nap. After his next lecture, J. B. S. Conkery took him aside and said, "Finish your doctorate, then talk to me." Wilbur Dowling said privately, "My federal funding came through like gangbreakers. Get your ticket, then talk to

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me." At home that night, Daingerfield figured he had put in a forty-two hour day.

The Dean was complimentary on the phone, but Murtin Spicer caught him the next morning in the parking lot looking pained but forgiving, and grumbling about academic showoffs.

"Be dipped," Smed Daingerfield told him. "With no warning I fly like a flag and now you shoot hot rockets at me." He tapped the professor with a stiff forefinger. "They said you were prickly but the noun is better." He spoke with the sure authority of a man whose idea has come to time. "Like the snake flag says, Don't Lean On Me, you sorry klotz." Spicer turned red and white and made glug-glub noises.

Daingerfield did not hear him. Standing by the rustic fence with roses beginning to climb, he was suddenly shot with illumination. As he watched, the pattern fell together:

Rent Time.

Your own time cupboard, room, apartment, house. Factory Installation. Ask for estimate, no salesman will call.

Real time is fun time. Let not a speck of a beautiful day go to waste. The Art of Triple Moonlighting.

Is today the 63rd of August? Know how old you are. Man dies of old age at 24. Personal Time Watches Our Specialty.

Instant aging of wine and cheese and beer.

Mabel, I was just in and out of the door. How in heavensh name could I get drunk in ten sheconds?

A time barn with cows and continuous milking.

Molecules seep or the pear would not have turned to a chip. Radio carbon check, potassium iodide, must establish the ratio, but not if Daingerfield could lay his hands on clocks counting the vibrations of ammonia gas molecules under electrical excitation. Better, get cesium clocks because the atoms in an atomic beam don't collide with each other as they do in the ammonia clock. Accurate to 1 part in 10 billion. 1 second in 300 years. That was 400 times more accurate than quartz crystal—

"—freedom of the laboratory to fix your TV," said Spicer indignantly. He sneered. "So what did you invent?"

"Are you still here?" Stiff finger to stomach. "I invented the Pisa connection. I hope the tower of Pisa has a clock, because if you have the inclination it's nice to have the time. But I got no time for you, Murty. Piss off."

Spicer gargled. He stamped his foot and as an overmastered man must, he coughed and turned preoccupied and sulked away.

A glory of women swaggered by. A movable feast. Smedley Daingerfield sighed. He would love to eat them up, but women scared him spitless. A veritable flower garden. He would love to run barefoot through them, except women were covered with cactus needles. He would have to do something about that . . .

If only he had the time. ■

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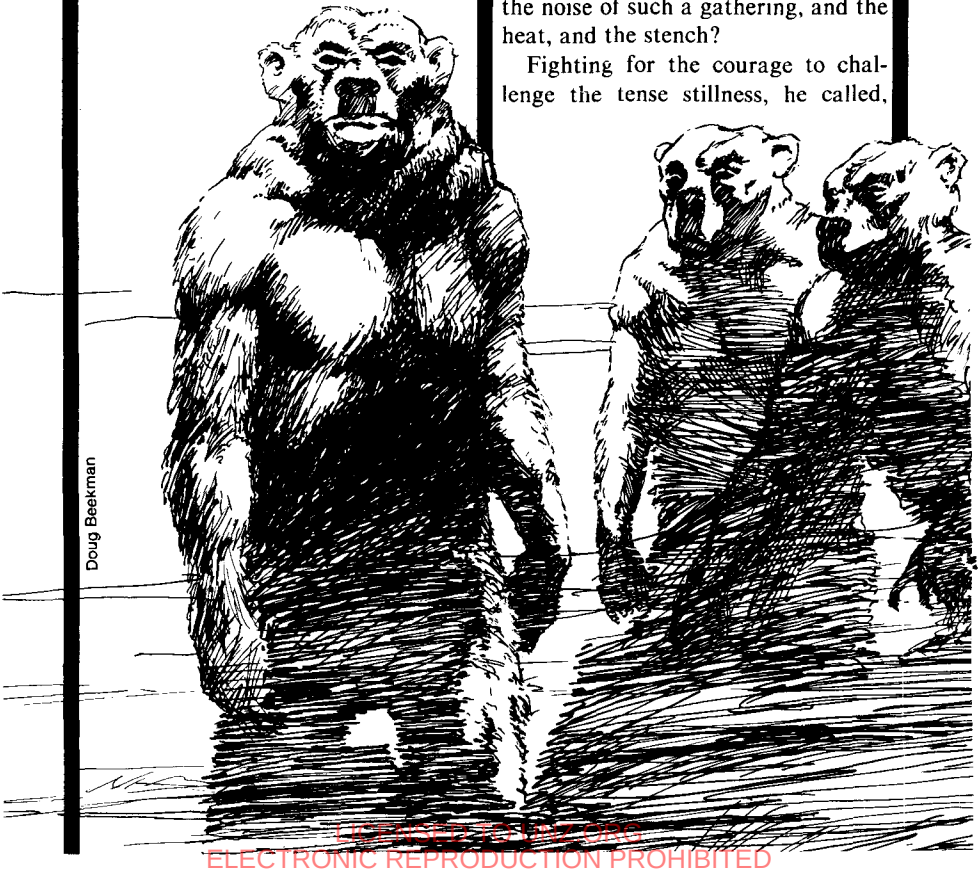
Behind the organ's deep throbs hid an almost-sound, a rustle, like that of cautious feet. As Sam Iwata stirred out of drowsiness, the violins masked a whisper that raced the length of the corridor. He came to full, uneasy alertness. Into the room swarmed angry eyes, burning holes in his back, beading his forehead with sweat. His hand darted to the volume control and the music died. Tightening his thin body, he raised his head above the back of the armchair and listened.

The station was silent, except for the hum of the electronics. Goose bumps roughened his skin; his clammy fingers fumbled for the pebbled butt of his hand laser. The air was thick with hostility. He longed to hit the deck and roll, but it was too late. The crowd's hatred was on him like sunlight focused by a magnifying glass; a sudden move could spark it into flame and fury.

Rationality asserted itself at last. He frowned. The sweat, squeezed together, trickled down his smooth face. He knew a mob had entered—his prickling spine insisted it was hundreds-strong—yet the room was only three meters by four. Apart from its physical impossibility, where was the noise of such a gathering, and the heat, and the stench?

Fighting for the courage to challenge the tense stillness, he called,



Doug Beekman

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"Bolts! Am I alone?"

"That you are, Sam," answered the computer.

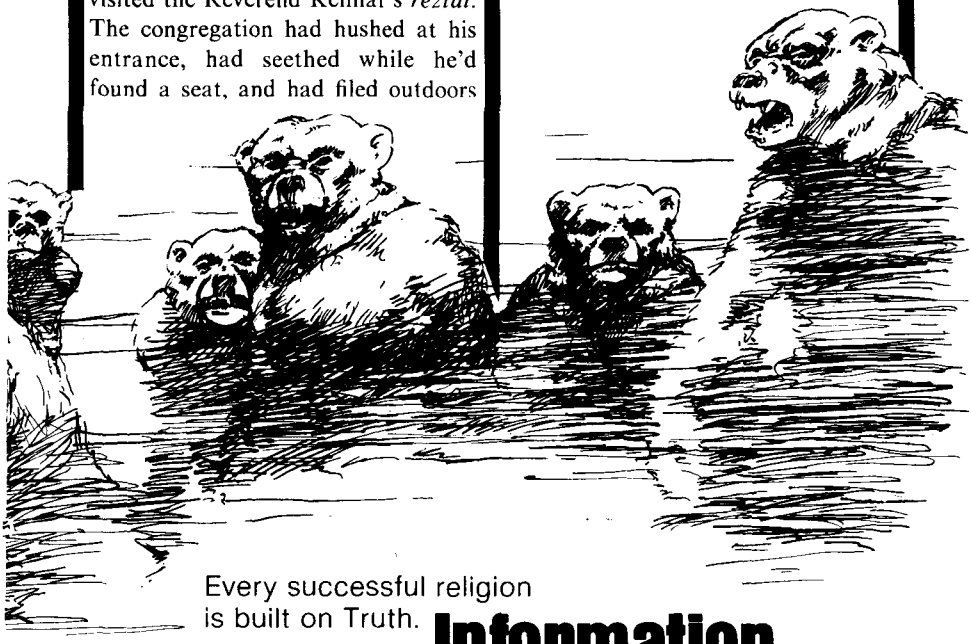
"Nobody else here?" Warily, he got up, flinching as he approached a place that his senses warned was occupied. For once, his bare feet didn't luxuriate in the carpet's spongy warmth; for once, they yearned to wear steel-toed kicking boots. "Nobody else at all?"

"Just you, Sam. Why?" The artificial voice sounded genuinely concerned.

"Because I feel . . ." Shivering, he found a match for the sensation in his memory. Some months earlier, he'd visited the Reverend Kemiar's *reztal.* The congregation had hushed at his entrance, had seethed while he'd found a seat, and had filed outdoors once he'd settled himself. He'd been left to share the cavernous building with a vicious, bitter pressure; it had quickly driven him out. "Bolts, I feel like I did in Kemiar's *reztal,* like there are thousands of eyes watching me, despising me . . . I—" He licked his lips and swallowed the thought. How could he tell a machine of his fear?

"Hum. You are sensitive, Sam, in a way that I'm not, but I've just this millisecond checked all my sensors. You are alone."

"But—" He stopped. Argument with the computer was futile. If it said he was alone, then . . . hot breath seared his neck and he whirled, laser



Every successful religion is built on Truth.

Kevin O'Donnell, Jr.

Information Station Sabbath

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drawn. The slightest sound would guide his aim.

"What are you doing, Sam?" asked Bolts.

"Somebody was—I mean, I just—there's . . ." He holstered the laser, stroked the soft leather, and sighed. From another part of the station came a high, ghostly laugh. "Wait a minute," he said, eager for any explanation, "outside—is there—"

"Not a chance." It paused delicately. "Sam, you want to spend some time in therapy?"

"Are you recommending it?" Bolts was the final arbiter of his fitness. If it recommended treatment, he would either undergo it, or risk his career: the Extraterrestrial Intelligence Agency mistrusted those who ignored the watchdogs of their sanity. But accepting analysis would prevent him from extending his tour of duty, which would terminate in two months. Though he hadn't decided whether to stay or go, he wanted to keep his options open. Besides, the Earthside psychiatrists were notorious for their readiness to ground people.

"I'm not even suggesting it, Sam, just offering. Maybe—"

"Let me think about it. Right now, I want you to inspect the defenses." His nerves steadied at the reminder of the station's impregnability. If the thick steel walls had been breached, the corridors could be sealed and filled with poison gas. Beyond them, every square inch of the interior was exposed to the computer's weapons. And for major emergencies, there was a force field. Tough enough to absorb all the energy of a direct nuclear hit, it guaranteed the survival of Information Station Sabbath.

Earth did *not* want to lose ISS, its only outpost on the planet. The Sabbathians refused to admit more Terrans because two factions of the planetary religion had yet to determine their status. One side, led by Reverend Kemiar, maintained that aliens were inferior because their gods were false, and that contact must be prohibited because it would inevitably contaminate the true religion. The other side insisted that their divinely-ordained duty was to enlighten the heathens, and that familiarity with alien beliefs could only vindicate the ultimate truth of their faith. The debate could drag on for years.

Earth didn't mind waiting. The star drive had given it ten thousand worthwhile planets in less than a century. Since half were inhabited, diplomatic personnel were scarce, and overworked. The other half cried out for exploration and exploitation. Academics, traders, and colonists had no time for a place where they weren't wanted. There were worlds enough elsewhere.

But Earth did need to know what was happening. To the Terran planners, isolation smacked of hostility, and hostility of potential conflict. An information-gatherer was needed, so that they could be prepared for anything. But no Terran spy could ever pass for one of the shambling, bear-like natives.

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The answer was simple. Construct a bilingual computer that could monitor broadcasts, read printed matter, query native informants, and defend its existence no matter how unpopular it happened to be. Then plunk it down and dare the natives to do anything about it.

The Sabbathians hadn't; that wasn't their way. They'd let it alone, and—once convinced that its human component had no desire to proselytize—they'd even permitted interested citizens to speak with him.

Sam Iwata had been in residence for twenty-two months. Like all his colleagues, he was a certified Rapport Man, a natural empath with a PhD in Alien Psychology. Years of fieldwork had heightened his understanding and lowered his profile. From a crowd of Rigellian sea-worms he'd emerge with a fistful of bosom buddies. He came as close to the ideal Rap Man as anybody ever had.

Though a competent technician when necessary, he was not on Sabbath to run ISS. That was the duty of the computer. His mission—and his successor's, if he departed at the end of his tour—was to counter Kemiar's isolationists. Winning support through any form of Terranization was expressly prohibited. He had to use his talents, and the station's knowledge of Sabbathian culture, to convince the natives that contact with Earth presented no threat to their religion. It would take a concerted, extended effort, but it wouldn't be overly complicated. Not for one who could catalog and calibrate every reaction to his ideas.

Now he cursed the handicap that had reinforced his inherent sensitivity. In a familiar environment, on a calm day, blindness only deprives one of visual beauty. In a crisis, it dams the flow of essential information and cripples the man who has to make a decision. Leaning on the brailled controls of the computer, Iwata longed for eyes as never before. If he could see for himself that the station was empty, the pressure he felt could be labeled a case of the jitters. As it was, he had to worry about a computer breakdown, even though it was designed to be self-repairing.

"Bolts," he demanded, suppressing a shudder, "what do the defenses say?"

"Nobody inside or outside but you, Sam." It made an aggrieved, coughing noise. "And before you order me to check for possible damage, I'd like to point out that I already have. Nothing is wrong. I am functioning as specified."

"Yeah, okay."

"Sam—" its tone became soothing, avuncular "—the Sabbathians are *not* going to hurt you. They're pacifists; violence has no part in their culture."

"So you've said." He faced the room, sniffed the air. Its peppery scent, from a vase of flowers in the corner, couldn't disguise a coil of inexplicable tension. "So *they've* said. And I don't believe either of you."

"Sam—their histories, my observations—can you disregard them?"

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"No, but—" Briefly, he considered consulting the psychiatric portion of Bolts. It would look better on his record if he requested it. "Look, we've found pacifist cultures before, but always on garden worlds, always living in families or small clans, always . . . well, damn near anarchistic. But this world: a large, tightly-knit urban society, with a highly organized religion, definite and unequal allocations of authority . . . how can there be authority without power, and power without force? . . . and then what the hell happens to the dissidents? Why haven't we found any?"

"Sam, there *are* two factions—"

"—quibbling over a point of dogma, that's all. Where are the people who challenge the entire orthodox canon? There's no hive mind here; there ought to be a whole range of opinions and there isn't. That bugs me—that bugs *hell* out of me, Bolts—because in all our experience, we've never found anything that produces such unanimity except force. And this world says it doesn't use any. I can't believe it, I just can't—"

"Later, Sam. Right now there's a visitor coming. Looks like Zentaya."

"Hmm?" He forced himself to calm down. Zentaya, a frequent caller, was a low-level empath himself, and would pick up Iwata's brooding suspicions if they weren't dampened. They would hurt him, which Iwata didn't want. If he did extend, it would be to deepen his friendship with Zentaya. "Let him in, huh?"

"Sure, Sam."

"Thanks." The tension in the atmosphere, no longer dwarfed by his turmoil, reclaimed his attention. He wondered if Zentaya would be able to sense it, too, and if he could offer some explanation. Striding down the long hallway, he hoped so.

The metal plating was cool against his fingers. "Okay, Bolts," he called. Behind him, a slab of steel shut off the corridor. Only after it had locked in place did the opening to the visitor's chamber retract.

"Ssam," hissed the Sabbathian, to whom esses came with difficulty, "how pleasant to ssee you again."

Iwata replied in the other's language, which he spoke better than Zentaya did English. Making sense of the Sabbathian's accent could be burdensome. "Thank you. I'm happy that you've come." Drying his sweaty palms on the velvet covering of the chair, he smiled. He heard Zentaya settle his 180 kilograms onto the custom-built sofa; something in the awkward brush of fur on plastic erased his smile. For all their size, Sabbathians were usually quite agile. "Something wrong, Zentaya?"

"Ah . . . well, I would hesitate to suggest that something is wrong, if you understand what I mean." He was fond of Iwata, but fear of accidentally offending him kept him circumspect. "Something *is* rather unusual, though."

"What's that?"

"The Divine Presence is very, very strong here tonight, Ssam. One notices It at all times, of course, but it's

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most unusual to find It so concentrated in a private dwelling."

Iwata stiffened. "The Divine Presence? Is that the feeling I've got, that somebody's here with us?"

"Yes, precisely. In a sense, you're being honored. I've never experienced such Divine Intensity outside of *reztal.*"

The Terran stroked his chin thoughtfully, glad to have his memory confirmed. At times, it was difficult to tell whether he was recalling actual events, or his own interpretation of those events. "But why here and now? And another thing—" avoiding mention of the unpleasantness at Kemiar's *reztal,* lest it make Zentaya defensive, he said, "forgive me for being frank, but It seems hostile. When I've felt It in your *reztal,* It's always been warm and friendly."

"Naturally. In the presence of those who worship It, God is joyful. As to why It is here—and I agree, It does seem . . . ah, reserved—I'm afraid I couldn't say. The Reverend Kemiar has initiated Eighteenth Day worship services, though—perhaps he's asked God to evaluate you in something approximating your native habitat."

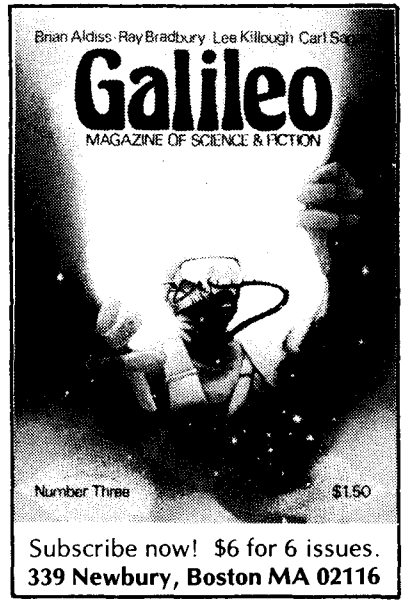
Iwata chuckled. "Zentaya, my friend, this hardly approximates my natural habitat. This—well, let's just say it doesn't remind me of home."

"True, but how would the Reverend Kemiar know that?" Though the deep, husky voice was as amused as Iwata's, it also held a tremor of uneasiness. "God would know, but It would investigate anyway, if It had been requested to. And of course, Its state of mind would be, ah, colored by the emotions of those who made the request—and since Reverend Kemiar cannot be numbered among your admirers . . ." He let it trail off, as though he'd said enough.

"So God can be prejudiced?"

"Yes," he said, reluctantly, because he'd seen his thought's destination, and he didn't want to go there, "but only by those who worship truly. Those who don't, or who misunderstand It or Its will, they have no influence with It."

"Uh-huh." He was thinking furiously. One tantalizing question—whether the eerie presence could possibly be a manifestation of God—had to be set aside at once. It was a matter



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of faith; neither knowledge nor logic could answer it. But Iwata couldn't even decide if there *was* a God.

No, he couldn't let himself worry about it. The important fact was that something intangible *was* in the station. The essential question was how the Sabbathians viewed it. If they believed It to be their God, and that Reverend Kemiar could bias It against Iwata, then they had to equate Kemiar with Truth, and adopt his posture toward aliens. Since that would result in the expulsion of Terrans from Sabbath, Iwata had to find a counter. "Zentaya," he began, choosing his words with care, "how will God announce Its decision about me?"

The alien squirmed, and made a noise deep in his chest. "Please excuse me; I'm a bit on edge and I seem to be short of breath. In answer to your question, I really don't know. Your case has no precedent."

"Then what does God do in other cases?"

"Well . . . It has, of course, been known to slay unbelievers."

"Slay?" echoed Iwata, startled.

"Why, yes. Death is the punishment for those who repudiate God."

"You mean," said the Rap Man, childishly pleased that Bolts would have to revise its analysis of Sabbathian culture, "that if somebody blasphemes, the priests execute him?"

"Not at all, Ssam." The couch hissed as he leaned forward. "We are peaceful. Violence is God's prerogative." He cleared his throat. "But I was not speaking of blasphemers, with whom God troubles Itself not. Unbelievers, you see, are those individuals who do not attend worship ceremonies. They are slain."

"Zentaya," he said, scratching his right temple, "I'm not too sure I understand." He kept the disappointment from his voice; it wouldn't do if his friend sensed his desire to strip the Sabbathians of their reputation for pacifism. "Can you back up and try again?"

"Certainly. Every Nineteenth Day, we go to *reztal* and beg God to bless us with Its Presence. It comes, It absorbs us into Its Beatific Self, and It permits us to abide there for a while, to remind us of the Paradise which awaits us. But . . . you once explained to me your expression of the tuber and the rod, yes?"

Iwata grinned. "That's the carrot and the stick, I think."

"Ah, yes. What is true for your people is true for mine. Some of us respond to the promise of pleasure, others to the promise of pain. Therefore God, in Its wisdom and Its love, both invites and impels us to worship It. It wants us all to join It in Paradise, which is impossible for those who will not worship. So It lures some of us to *reztal* through the ecstasy of absorption; others need to be driven by the threat of death."

"You're saying that God Itself kills the unbelievers?"

"Yes." Surprise infiltrated his voice. "I thought I'd made that clear."

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"Not to me. I'm dense."

"Oh. Well, you see, while we are performing our duties to the Being That is Responsible for Everything, It is punishing those who ignore It."

"How?"

"By death," Zentaya replied with a trace of impatience.

"I understand that, now. What I meant was how does God slay them?"

"Who knows? God can be incomprehensible to lesser beings. All we know is that the corpses wear agonized expressions."

Rubbing his jaw between thumb and forefinger, Iwata wondered why the Presence seemed to be gathering strength. "Zentaya, your race claims to be so peaceful that you've never had a war."

"That's right," he answered. Pride made his voice buoyant; nervousness gave it waves to ride.

"How is it, then, that such a peaceful race has such a stern, er, almost ferocious God?" The tension mounted sharply, as though his question had offended someone. "It seems contradictory," he finished lamely.

"Not at all, Ssam, not at all." He wasn't speaking to the Terran any more, but to something that hovered just behind his left shoulder. He was frightened; the words rushed out of him as though their velocity could protect him. "We are the first to admit it. God *is* inflexible, and *is* bloodthirsty. But this is good. Those two attributes *keep* us peaceful. Your God also banned wars, but they occurred anyway. Why? The answer is obvious: those who warred did not fear being stricken down for their impiety. It is clear to me, although I am no theologian, that your people have never been in contact with the One, True God—had you known It, your roster of heroes would be considerably shorter." His placatory chuckle, intended for someone other than Iwata, ended in an amazed grunt. He leaped to his feet.

"What's wrong?" The tension, almost palpable, resisted his effort to rise.

"I—ug—I—" He pulled air into his lungs with a tortured wheeze. "Cramp—stomach—I . . . oh, no! Head . . ." His massive body crashed to the floor.

Laser in hand, the Rap Man knelt next to him. Whatever was with them was running rampant. Its hostility, flaring like a torch, roared through his mind, and left it full of smoke. "Zentaya, what's the matter?" His hand groped for the Sabbathian's furry brow, then pulled away. The reflex action could do no good. "Is there a doctor I can call?"

"Trenthiata . . . call Tren—thi—ata."

"Bolts!" Zentaya was starting to broadcast his pain and Iwata was picking it up. He shook his head and tried to raise some screens around his mind.

"Yeah, Sam, I'm doing it right now." The voice seemed to come from afar.

One empathic barrier went up, and

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blocked most of the invading impressions. His thoughts cleared a little. He tried to extend its protection to his friend, but the attempt failed. "Can your MD section handle a Sabbathian?"

"Insufficient data, Sam—wouldn't know what to do with him."

"AAAGGGHHH! Bright, bright, too bright—give me dark—ug! Oh, please . . ." Zentaya's three-meter form spasmed like a fish on a boat deck.

A flailing forearm caught Iwata in the ribs, and threw him across the room. His head hit the sofa; his defenses jarred loose. Raw emotion overwhelmed him. Hate and agony spun together, around and around. A voracious firestorm burned his screens away, and touched his being. He felt the outermost layer of mental callous start to char, and gasped. The incoming sensations doubled in intensity. If he survived, he thought with aloof, disconnected clarity, he'd be abnormally sensitive for weeks, until new armor formed.

"OH GOD!" screamed Zentaya. "Mother . . . oh, stop it, please stop . . . turn off the . . . no more, I can't . . . ohgodohgodohgod . . ." He whimpered once more before his thrashings stilled. The presence, quiet now, floated above him for a minute. Then, as if satisfied, it dwindled and was gone.

"Sam?" Getting no answer, the computer extended a tentacular sensor and tapped the Rap Man's shoulder. "Sam?"

"Uh . . . yeah, Bolts, I'm . . . I'm okay." He pushed himself onto his hands and knees, then rested. His brain felt blistered.

"I know you're okay, Sam. It's Zentaya. His heart's stopped. Trenthiata's on the way, but he won't be here for a minute or so. Sensors also say no brain activity, and no motion whatsoever. I think he's dead."

"Dead?" He crawled across the floor, wincing at the pain in his ribs. He focused his protesting mind on Zentaya, but nothing registered. His fingers slid through fur until he'd located his friend's wrist. Lifting the arm was like lifting . . . he couldn't find an apt simile. There was no sense of assistance, no resistance except gravity's, just warm, soft massivity. "I think," he said slowly, "you're right."

"I usually am . . . Sam? My programming—and my sensors—tell me that you're experiencing strong emotion. I . . . I wish I could share it."

"Thanks, Bolts." He laid the huge arm across the quiet chest and stood up. "Is Trenthiata here yet?"

"Almost."

"Um." He lowered himself into his chair. "Let him in, will you?"

"Sure, Sam."

The door hissed open. Rapid breathing disturbed the air, then stopped abruptly. After two careful footsteps, and the sound of a bag scraping on the floor, it resumed. Iwata heard fur probe fur. His mind caught fearful surprise. "He's dead,"

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said the doctor in a high-pitched voice. The smoky aroma of expensive Sabbathian liquor somehow lessened the dignity of his pronouncement.

"What happened to him?" His words rang flat and empty.

Embarrassment. Confusion. "Well, I've hardly had time to—"

"What is your initial impression, Doctor?" demanded Iwata icily.

"Well, I've seen . . . that is, in certain instances, the facial features of the deceased, along with the disposition of the extremities, bear resemblances to this, but . . . no, it's impossible." His mind made plain his fear of considering the hypothesis he'd suspected.

"Doctor." The single word was a threat.

Another fear, almost terror. Xenophobia. "I shall have to conduct an autopsy," hedged Trenthiata, "but . . . one question, please: had Zentaya complained of feeling ill lately?"

"Not to me."

"Well." Nervousness trembled in the still air. "He seems to have died at the Hand of God. That's all I can say now. No more." He picked up his bag; the metal studs on its bottom snapped carpet fibers. "I'll have an ambulance here—"

"Already ordered, Doctor," interrupted Bolts.

"What? Oh, oh, it's . . . it's you. Yes. Well. We'll remove the body as soon as it comes. I shall conduct an autopsy at once. Then . . . well, if you'll call me tomorrow—"

"You'll see me at *reztal,* Doctor."

"Well, that's . . . that's good." He floundered to the door. "Uh—I really must—"

"Open it, Bolts."

"Thank you, thank you . . . uh, good night, now."

Iwata said nothing then, nor later, when the ambulance attendants wheeled away the corpse. Statue-rigid, he filled the room with his grief and his anger, and wallowed in the echoes. Hours passed before Bolts made a harrumphing sound. "Sam—sitting up all night isn't going to help any. Why don't you take a sedative and go to bed?"

"Yeah." Wearily, he pushed himself out of the chair. "I want you to send a message, Bolts. Tell Earth I'm not going to extend. Tell them I want my replacement here on time. Got it?"

"Got it. How come?"

Shrugging, Iwata entered the interior. "Why not? Any RM can do this job, and probably better. And there's nothing here for me, any more, now that Zentaya's . . ." He choked it off, and turned into his bedroom. "Gimme the pill."

It was in his hand in one second, and down his throat in another. Not bothering to disrobe, he sprawled across his bed. The soporific hit quickly. His muscles relaxed; his mind unclenched. He was two-thirds of the way into sleep before he asked himself why he was still alive.

Nineteenth Day, the Sabbathian

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Holy Day, was warm and dry. A grass-scented breeze ruffled Iwata's hair as he strolled along the hard-surfaced road. An air car whooshed past, and he twitched at the sting of its passengers' emotions. They were clearly afraid, as well as anxious about . . . they were out of range.

For a moment he was angry. He'd expected his heightened sensitivity to harass him with unwanted, undivertable emotions, but he'd thought they'd be different. Except for the doctor, no Sabbathian had ever feared him—disliked him, yes; condescended to him, yes—but fear? It was depressing to think that an entire race had mendaciously distorted its emotions to . . . his anger dissipated as he realized his absurdity.

There was a much more likely explanation: Zentaya's death. News about aliens spreads rapidly on a world where there are few; Zentaya's entire neighborhood would have learned of the tragedy before dawn.

He could no longer blame them for their fear. In their eyes, God had warned them not to associate with Terrans by killing a man who had.

Gloomily, he descended the *reztal* steps. Chatting Sabbathians collapsed into silence, and squeezed back. Their fear rose like a stinking fog; it was all he could do to pass through it. Jaw set, he entered the underground building, but for once had no trouble finding an empty seat. With shuffles and slithers, the congregation gave him his choice of about fifty. It was something they'd do for any plague-carrier.

He wondered if they'd leave, if they'd shun him as Kemiar's people had. He could feel how much they wanted to; he could hear those at the door wrestling with the problem in their minds. But the decision wasn't theirs to make. They, and he, would have to wait for the priest.

So he listened to their wrigglings and smelled their sweat and tried not to show how their probing eyes burned his skin. He rubbed his fingers over the stone seat, tracing hollows left by generations of buttocks, wondering if anyone else had ever caused so much alarm by his simple presence. The stone said nothing.

Bare paws slapped the sanctuary floor. The congregation fussed itself into readiness, yet the Reverend Misanja was still. The worshippers leaned tautly toward him and demanded with their silence that he speak. He let them hang; Iwata sensed a high-strung male in the front tense up for a scream and then:

"The alien is among us," boomed the priest. A sigh swept the vast chamber. "He will *stay* among us, for it is God That summons, and God That dismisses. God has brought the alien here—for what purpose we pitiable vermin cannot know—and God will send the alien away when it suits It. Usurp not God's Judgeship! Make not a decision against the alien lest God later decide against you!" he cleared his throat and rummaged through the papers on the pulpit.

The congregation was shocked; it had expected him to lead the attack.

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not the defense. Unhappy whispers broke out, and swelled rapidly into mutters of dismay. Overriding them, the priest's gruff voice demanded back their attention. Unwillingly, they gave it. In a different voice, one that was soft and low and inviting, he said, "God Calls."

Iwata was forgotten; he sensed himself disappear from their minds like light from a switched-off bulb. Excitement ran through them. Backs straightened, faces lifted, eyes widened.

"It does call you!" sang the priest.

Iwata tried to puzzle out what form of mass hypnosis could take effect so quickly and so firmly. It was always that efficient, though this time there was a difference; Misanja's words seemed directed at him. He felt singled out, until he realized that the loss of his mental protection had made him more sensitive. Perhaps the priest had the power to convince each worshipper that the ritual incantation was meant for him alone.

"God Comes!" rang in his ears. His breath ran quick and shallow; he awakened to a Presence that churned above their heads like a miniature tornado. The Sabbathians welcomed it with silent jubilation; Iwata, with anxiety.

It was very like Zentaya's killer. The Rap Man braced himself, and focused his mind on it. Yes, there was the same impression of ruthless power, the same feeling of arrogant illimitability. He peered closer, and frowned. There was something else: a hint of elasticity that last night's hadn't had. It wasn't the same Presence.

It whirled around the *reztal,* sucking the worshippers into a trance, incorporating their spirits into Itself. *This is what Zentaya meant,* thought Iwata. Bodies went limp when the Presence took their occupants. He heard them tumble onto the floor.

While the Presence fattened, Iwata wondered. The Sabbathians called It their One, True God—but since It wasn't the same as the one that had killed Zentaya, then . . . or could it simply be that Its nature altered with Its mood? But that didn't matter, as long as it came for him, and soon.

He stiffened as he understood what he'd just thought. For the first time, the ceremony had affected him. Normally, he stayed awake. While the others moved through their trance, he'd stay put, pray his own prayers, and wait for the priest to guide them back. His missing armor must have defended him better than he'd known.

He swayed as the Presence passed by, he heard It intone his name, and he felt it pick up a straggler. He was impatient to enter. Samuel Isaac Iwata remembered clouds of incense on altar steps, and was awed. Dr. S.I. Iwata's only regret was that he couldn't take a notebook into a trance. And Ssam, the funny looking alien who liked to bullshit about art and history, he had a score to settle.

The Presence, a whirlwind above the pulpit, wobbled through a full

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circle, as if searching for the overlooked. Iwata sat straight, almost ready to call out. It noticed him. It hesitated once. Then it roared down the aisle and was on him.

Wrong term, he thought. *I am on It. No, I'm in It. Uh-uh, I'm both in It and on It.* It tugged him loose; his body slithered to the floor. All contact with the world was severed.

Blackness, deep and intense, had him in its familiar clutch. The wind howled like a flight of banshees. He was somersaulting through weightlessness, head over heels over head until he grew concerned that he wasn't dizzy. Then he stopped.

He tottered like a balloon caught by cross-breezes. Thoughts drifted by, delighting him with the purity of their crystalline structures. As they passed, he could study them with his full awareness because he was undistracted by bodily demands. He could smell nothing, taste nothing, see . . . nothing? A band of light forced itself upon him. Intuitively, he knew that to accept it would be to become encumbered. He crawled deeper into his being. The light was . . . he struggled to remember its name, for thirty years had faded since his eyes had last translated light. He retreated from the invader, slipping and sliding through his mind, but it leapfrogged him. Barring his escape route, its rays impelled him forward, to the very brink, the point where *I* left off and *Else* began. Resigned to embodiment, he looked out.

He hung above a cool plain, colored . . . gray, he remembered. A thousand shades of it, with nowhere a tinge of anything else. His new body formed out of his mind's energy, and drew him away from the world of pure

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thought. His feet scraped. Bare feet. He frowned at them, and then at his ankle-length white robe, and then at the beard that rippled across half his chest.

A being approached, slightly taller than he, but much broader. Its red pelt, long and silky, coated muscles that flowed like a mountain stream. A black tipped muzzle opened and a Sabbathian voice asked, "Do you mean us harm?"

"Us?" He blinked, and was delighted with the way vision returned when eyelids rode up.

The Sabbathian paused, and seemed to gather strength for an exhausting endeavor. His thick paw gestured to a group of like beings. "Us."

"Harm? No, not at all. I don't mean anybody harm." When the other started to leave, Iwata's hand delayed him. "Hey, please tell me, where am I? Where is this?" He got no response. The native finished his pivot and moved back to his companions. Still hoping for an answer, Iwata followed.

"He means us no harm," he heard his questioner declare. Heads bobbed slowly and faces turned away. Another voice rose into the gray air: "Who knows of one who mocks God by refusing to worship It?"

"I do," said an individual at the fringe of the large crowd. Iwata looked, then rubbed his eyes. Like the others, the speaker was tall, red, and heavy-set. But he seemed blurred: the strands of his fur ran together, and his paws were flippers. In his open mouth were two U-shaped bars of ivory.

"Who does not worship?" demanded the first voice, suddenly familiar. Iwata closed his eyes, remembered it as Misanja's, and opened them. The image rushed in with painful clarity, each of its features outlined in darker red.

"My grandmother," came the response.

"Lead us to her."

The group contracted, shoulders bumped, faces found a common direction. Legs pumped. Ground slipped under them, but the uniformity of the plain made their speed difficult to determine. Iwata was the only one who turned his head. Then a figure loomed up. She had gray fur, and a bent spine. Her eyes were dull; her mouth—when loose lips parted in a senile cackle—were toothless. She didn't notice her besiegers.

The priest examined the old lady. Something nibbled at Iwata's attention. He looked from one to the other. There was something strange about . . . he inspected the rest.

Every member of the—*it must be the congregation,* he decided—looked alike. Same height, build, facial structure, and color. The only difference between individuals was the clarity of their features. On some, like Misanja, each seemed to stand apart from the rest and assert its uniqueness. On others, like the grandson of the old woman, everything blended into everything else.

The priest touched the old lady on

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the shoulder. "Do you mean us harm?"

She looked at him—through him—and didn't answer.

The priest turned to the congregation and announced, "Guilty!"

The communal mood shifted. Bared fangs glistened as complacence melted. Iwata, sensing love twist into hate, doubled over, his belly racked by icy cramps. Scattered growls broke the peace and multiplied. To a thunderous rumble, the crowd surged. The sparse gray pelt disappeared under a wave of flame. A single, sobbing shriek rose over the angry mutters. When the crowd backed away, she was gone.

Ssam Iwata shuddered. Dr. S.I. Iwata brightened. That one scene had resolved the paradox of Sabbath: he had just witnessed "God's" punishment. Only a few loose ends remained.

The group began to drift away. Iwata tried to question a being of medium clarity, but he got nowhere. Confused, he reached for his empathy, then shook his head in disgust. It was like trying to read a sleeper . . . he scratched his jaw. Something about that seemed applicable.

Say that Sabbathians are naturally telepathic, but that . . . he licked his lips . . . they can't use it while conscious, only when . . . no, not unconscious, but in some halfway stage, some trance state, like the one initiated by the Presence of God . . . of course, that might come when they're all focusing on one idea, one desire, and when one plunges into it, his passage creates a suction that pulls others in after him, and . . .

"Do you mean us harm?" A black furry body barred his path.

He looked up, alarmed by a sudden chill in the air. "No, I told you, I don't."

Red eyes, startled; pink tongue, flicking in surprise. "So you know."

So you know . . . so you know . . . the words spiraled down to where memories were filed . . . they awaked identifications, which nudged Iwata and whispered, "Reverend Kemiar."

"Reverend," smiled Iwata nervously, "how nice to see you." A confusion of bodies swirled around him; two crowds were flowing through each other. The warm red fur was moving away; cold ebony was closing in. Iwata nibbled on his thumbnail and asked, "Why are your people black, and not red?"

Kemiar looked relieved. "So you *don't* know."

"Know what?"

"Anything." Contemptuous, he lifted his muzzle in a Sabbathian shrug. "Where you are, for instance."

"The best I can figure," said Iwata, "I'm in some kind of collective subconscious. Or something like that. Hey, you can talk!"

"As can you. But I fear we are the only two. These others—" his paw flashed disparagingly "—they know nothing."

"Why is that?" prodded the Rap Man.

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Danger glittered in Kemiar's eyes. "You have a right to know," he decided. "Even a condemned infidel deserves that much."

Iwata bristled. "How could an infidel enter the Presence of God?"

"Because it's not. Does this desolation resemble the majesty of God?"

"No." He scanned the gray horizon. "But what is it?"

"A dream world where we articulate our vision of the Divine." He motioned his followers back, and squatted. "Every man carries with him an image of God, against which he measures himself. In *reztal,* we concentrate on that image, we project it, we offer it to others for their approval and their advice. The visions reinforce each other, and this world is born."

Dimly, Iwata understood. "But why are the rest so, so—"

"Unaware?" Kemiar's grin bared his shining fangs. "One of two reasons, or perhaps a combination of both. Either they lack the mental vigor to sustain an intelligent personality as well as a body, or they are not as devout as they should be, and thus do not allow themselves to exert all their effort."

"And the killings? Why the killings?"

"The group must protect itself. Difference is danger." His massive paw slit the air, as if to underline his insight. "Those who reject society's ways threaten its survival. In the real world, it's hard to grasp their essence. Here, where all must be honest, we see them for what they are. As we see you." Lumbering to his feet, he menaced Iwata with his bulk. "You are different. You are contaminating us. You—"

"Wait." Iwata held up a hand. "Why Zentaya? What did he do?"

"He admired you, and was . . . changing." Pronounced by Kemiar, the word intimated indescribable filth. "Being a man of influence, he would have affected everyone. He had to die. As do you." He turned to his followers. "Unbeliever," he snarled, laying his paw on Iwata's shoulder.

A being shuffled forward. "Do you mean us harm?" asked its young woman's voice.

The eyes on Iwata's throat were naked swords. "I mean you no harm." He swallowed as they withdrew.

"Look at him!" commanded Kemiar. "Does his form proclaim his faith?"

Emotionlessly she obeyed. "Do you deny our God?"

"I do not deny your God." He relaxed when she stepped back.

Again Kemiar's shrill urgency kept her from being satisfied. "Why does his form differ from ours, then?"

"Do you affirm the supremacy of our God?"

Iwata could not avoid the trap. In that world of shadows, untruth was impossible. He could speak or not speak, but his mind and body would not permit a falsehood. He remained silent until he recalled what had befallen the old lady, then at last said, "I do not know."

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Kemiar's triumphant laugh floated over the crowd like a bugle call. They advanced on him, paws upraised, mouths open, white-fanged jaws slavering. He backed away. Kemiar roared with delight. "You cannot flee, Terran—they'll tear you apart."

His first impulse was to retreat into his own body, but he realized with dismay that a portion of him would remain behind, vulnerable. He had to stay, even though the mob was encircling him. He cursed his robe for hampering his movements, then stopped dead. A thought burst like a flare above a battlefield.

Robeandbeard and I'm awfully damn tall—aha!—anthropomorphism! Look like—am?—old Christian God; attacked because appearance is essence of belief, here, at least. If I didn't look—

A paw sent him flying; he bounced and rolled for a dozen feet. His thoughts jumbled into an amorphous ball that robbed his figure of its characteristics. A dirty-gray heap, he lay motionless and caught his breath. The answer came to him as the mob hesitated. He closed his eyes, concentrated, and then worked his way to his feet. The crowd fell back, then to its knees. Only Kemiar stayed erect.

"Liar!" screamed the priest. "Heretic!"

"No," corrected Iwata gently. "Untruth is impossible here. I embody what might be the truth."

He towered above them and commanded them to look. Their eyes hid from his radiance. He raked silver-clawed paws through the golden fur on his chest, and reveled in the shimmer that outlined each hair. A single step set the earth to vibrating. His smile was like the sun; his laugh echoed off the sky. He watched their fur change color till it approximated his. When they'd completed their avowal of fidelity, Kemiar, aloof and isolated, was a lump of coal in a chest of gold.

So they shredded him.

"Listen, Sam," Bolts was saying, "I understand *what* you did, but I don't understand *why*, or why they responded the way they did."

Iwata sipped his coffee and smiled. "It's not so hard. My first appearance said I believed in a different God, but my second, to them, was more God-like than their own. It convinced them that I was honoring their God. Kemiar's refusal to change suggested that he was repudiating it."

"Then why—he must have understood—why didn't he change, too?"

"He couldn't." Despite Bolts' obvious impatience, he paused to pour himself another cup. "He thought that as an alien, I *had* to be wrong in my interpretation of the Divine Form. He couldn't adopt a shape he thought was incorrect."

"Another thing. Why did the old lady look like herself?"

"Well . . . the way I figure it, and I warn you this could be a little complicated, it's a vestigial trait."

"Huh?"

"Once upon a time, all Sabbathians

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were telepathic, in the sense of being able to communicate—these days, all they can do is identify themselves."

"Uh-huh. Go on."

"My theory is that they constantly projected a mental self-image so that others, trying to talk with them via thought, could find them. Hmm?"

"Uh—keep going."

"At some point, the clans started using that TP world as a battleground. The warriors, including women and children because physical strength didn't matter, would take the shape of the clan totem, and attack any different totems. Naturally, the clan that absorbed conquered peoples became the largest, which helped it eliminate the rest. Its success gave its totem an aura of divine favor, which led up to the present worldwide religion. Unfortunately, it played hell with their telepathy."

"How come?"

"Just think. The people with the strongest powers must have been the leaders, because they'd have had more surplus energy for independent thought. If their totem was unpopular—zap! I'm sure that they took the brunt of the fighting, that's elementary strategy. Then, with spreading tranquility, rituals accreted. Those who understood that world, but weren't religious, would have found it more and more difficult to profess their faith—so they would have been wiped out. And the faithful would have become priests, who are celibate here, too. What it all adds up to is that Sabbath has bred for weak telepathy." Iwata paused.

"Uh-huh. So what happens next?"

"Well . . . with Kemiar dead, the anti-alien movement will peter out, which means we'll be allowed in. However, that might not be too safe for our people. If any of them are even a little telepathic, they'll project a self-image, and come Nineteenth Day . . ." He shook his head. "I'm going to have to find natives like Kemiar, but without his fanaticism, and show them how everything works, and get them to protect any endangered aliens. It's going to take me a lo-ong time."

"I? Me?"

"Yeah. Why?"

"You instructed me to send a message?"

"Oh, Lord." He clapped his hand to his mouth. "I forgot all about that. What am I going to—look, can you send another, canceling the first?"

"I could . . . but why bother?"

"Bolts!" He was on his feet, gesturing with clenched fists. "I've found a world where I can stretch my talents to the fullest! And another world, one I've learned how to get into, where . . . where I have eyes, eyes that work. It's bleak, now, but give me time and a few telepaths . . . we'll make it beautiful. Bolts, you gotta cancel that first message!"

"No, I don't." It chuckled. "Figuring you wouldn't leave without a fight, I never sent it. I have faith, too." It extruded a sensor that performed a fancy bow. "More coffee?" ■

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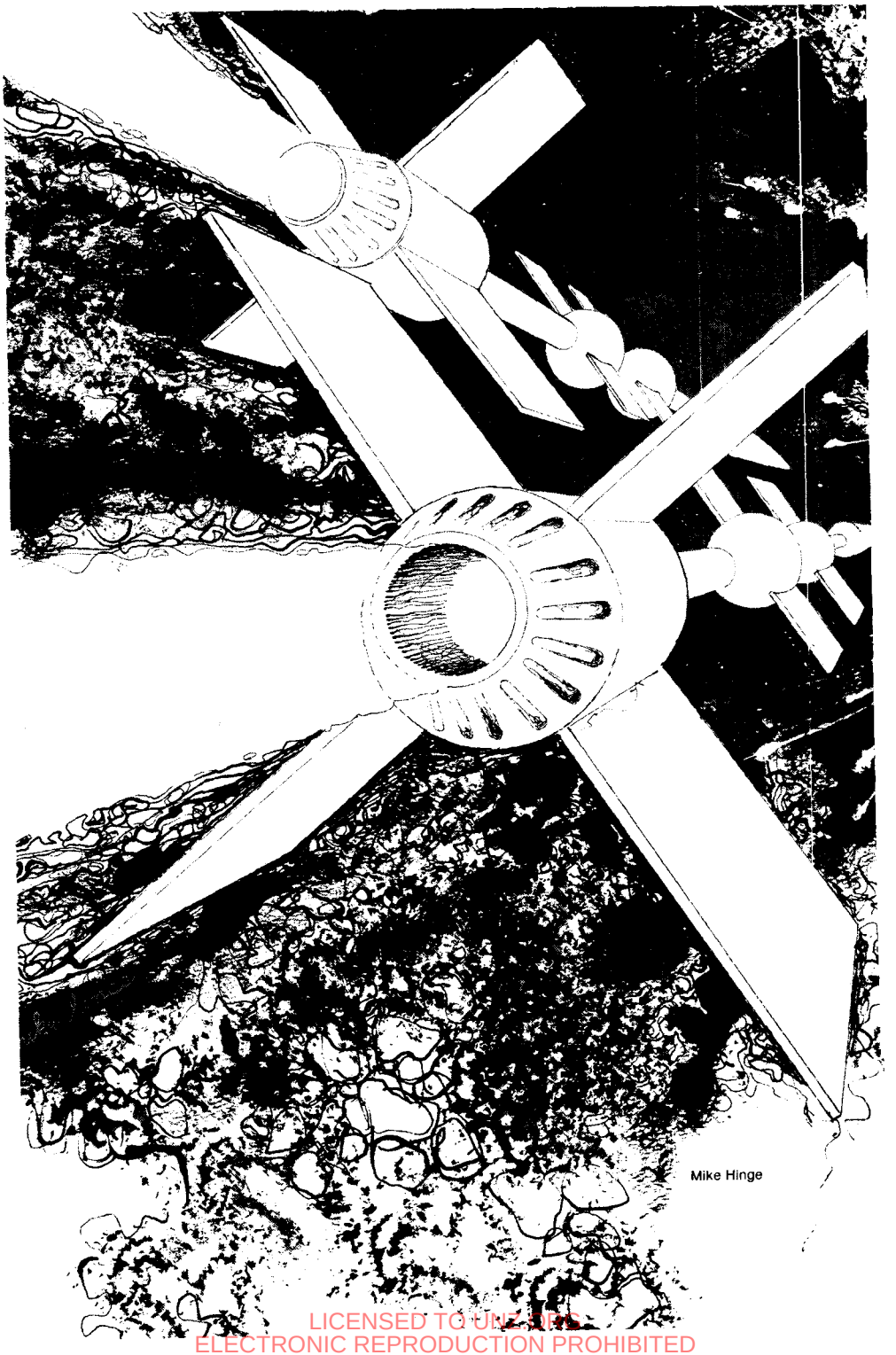

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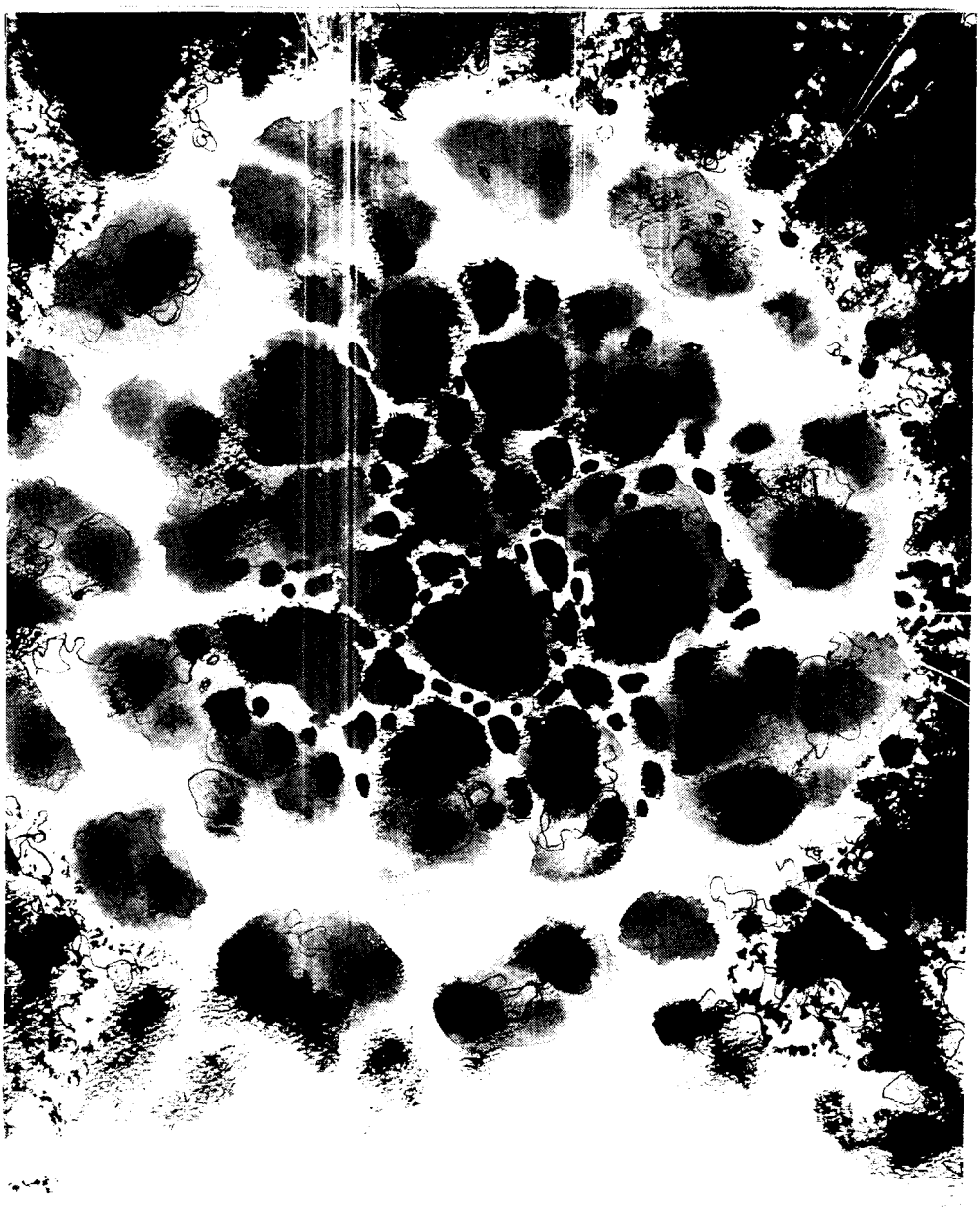

Orson Scott Card

No simulator can reproduce *all* the elements of battle.

Ender's Game

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"Whatever your gravity is when you get to the door, remember—the enemy's gate is *down.* If you step through your own door like you're out for a stroll, you're a big target and you deserve to get hit. With more than a flasher." Ender Wiggin paused and looked over the group. Most were just watching him nervously. A few understanding. A few sullen and resisting.

First day with this army, all fresh from the teacher squads, and Ender had forgotten how young new kids could be. He'd been in it for three years, they'd had six months—nobody over nine years old in the whole bunch. But they were his. At eleven, he was half a year early to be a commander. He'd had a toon of his own and knew a few tricks but there were forty in his new army. Green. All marksmen with a flasher, all in top shape, or they wouldn't be here—but they were all just as likely as not to get wiped out first time into battle.

"Remember," he went on, "they can't see you till you get through that door. But the second you're out, they'll be on you. So hit that door the way you want to be when they shoot at you. Legs up under you, going straight *down."* He pointed at a sullen kid who looked like he was only seven, the smallest of them all. "Which way is down, greenoh!"

"Toward the enemy door." The answer was quick. It was also surly, saying, "yeah, yeah, now get on with the important stuff."

"Name, kid?"

"Bean."

"Get that for size or for brains?"

Bean didn't answer. The rest laughed a little. Ender had chosen right. This kid *was* younger than the rest, must have been advanced because he was sharp. The others didn't like him much, they were happy to see him taken down a little. Like Ender's first commander had taken him down.

"Well, Bean, you're right onto things. Now I tell you this, nobody's gonna get through that door without a good chance of getting hit. A lot of you are going to be turned into cement somewhere. Make sure it's your legs. Right? If only your legs get hit, then only your legs get frozen, and in nullo that's no sweat." Ender turned to one of the dazed ones. "What're legs for? Hmmm?"

Blank stare. Confusion. Stammer.

"Forget it. Guess I'll have to ask Bean here."

"Legs are for pushing off walls." Still bored.

"Thanks, Bean. Get that, everybody?" They all got it, and didn't like getting it from Bean. "Right. You can't *see* with legs, you can't *shoot* with legs, and most of the time they just get in the way. If they get frozen sticking straight out you've turned yourself into a blimp. No way to hide. So how do legs go?"

A few answered this time, to prove that Bean wasn't the only one who knew anything. "Under you. Tucked up under."

"Right. A shield. You're kneeling on a shield, and the shield is your own

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legs. And there's a trick to the suits. Even when your legs are flashed you can *still* kick off. I've never seen anybody do it but me—but you're all gonna learn it."

Ender Wiggin turned on his flasher. It glowed faintly green in his hand. Then he let himself rise in the weightless workout room, pulled his legs under him as though he were kneeling, and flashed both of them. Immediately his suit stiffened at the knees and ankles, so that he couldn't bend at all.

"Okay, I'm frozen, see?"

He was floating a meter above them. They all looked up at him, puzzled. He leaned back and caught one of the handholds on the wall behind him, and pulled himself flush against the wall.

"I'm stuck at a wall. If I had legs, I'd use legs, and string myself out like a string *bean,* right?"

They laughed.

"But I don't have legs, and that's *better,* got it? Because of this." Ender jackknifed at the waist, then straightened out violently. He was across the workout room in only a moment. From the other side he called to them. "Got that? I didn't use hands, so I still had use of my flasher. *And* I didn't have my legs floating five feet behind me. Now watch it again."

He repeated the jackknife, and caught a handhold on the wall near them. "Now, I don't just want you to do that when they've flashed your legs. I want you to do that when you've still got legs, because it's better. And because they'll never be expecting it. All right now, everybody up in the air and kneeling."

Most were up in a few seconds. Ender flashed the stragglers, and they dangled, helplessly frozen, while the others laughed. "When I give an order, you move. Got it? When we're at a door and they clear it, I'll be giving you orders in two seconds, as soon as I see the setup. And when I give the order you better be out there, because whoever's out there first is going to win, unless he's a fool. I'm not. And you better not be, or I'll have you back in the teacher squads." He saw more than a few of them gulp, and the frozen ones looked at him with fear. "You guys who are hanging there. You watch. You'll thaw out in about fifteen minutes, and let's see if you can catch up to the others."

For the next half hour Ender had them jackknifing off walls. He called a stop when he saw that they all had the basic idea. They were a good group, maybe. They'd get better.

"Now you're warmed up," he said to them, "we'll start working."

Ender was the last one out after practice, since he stayed to help some of the slower ones improve on technique. They'd had good teachers, but like all armies they were uneven, and some of them could be a real drawback in battle. Their first battle might be weeks away. It might be tomorrow. A schedule was never printed. The commander just woke up and found a note by his bunk, giving him the time

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of his battle and the name of his opponent. So for the first while he was going to drive his boys until they were in top shape—all of them. Ready for anything, at any time. Strategy was nice, but it was worth nothing if the soldiers couldn't hold up under the strain.

He turned the corner into the residence wing and found himself face to face with Bean, the seven-year-old he had picked on all through practice that day. Problems. Ender didn't want problems right now.

"Ho, Bean."

"Ho, Ender."

Pause.

"Sir," Ender said softly.

"We're not on duty."

"In my army, Bean, we're always on duty." Ender brushed past him.

Bean's high voice piped up behind him. "I know what you're doing, Ender, sir, and I'm warning you."

Ender turned slowly and looked at him. "Warning me?"

"I'm the best man you've got. But I'd better be treated like it."

"Or what?" Ender smiled menacingly.

"Or I'll be the worst man you've got. One or the other."

"And what do you want? Love and kisses?" Ender was getting angry.

Bean was unworried. "I want a toon."

Ender walked back to him and stood looking down into his eyes. "I'll give a toon," he said, "to the boys who prove they're worth something. They've got to be good soldiers, they've got to know how to take orders, they've got to be able to think for themselves in a pinch, and they've got to be able to keep respect. That's how I got to be a commander. That's how you'll get to be a toon leader."

Bean smiled. "That's fair. *If* you actually work that way, I'll be a toon leader in a month."

Ender reached down and grabbed the front of his uniform and shoved him into the wall. "When I say I work a certain way, Bean, then that's the way I work."

Bean just smiled. Ender let go of him and walked away, and didn't look back. He was sure, without looking, that Bean was still watching, still smiling, still just a little contemptuous. He might make a good toon leader at that. Ender would keep an eye on him.

Captain Graff, six foot two and a little chubby, stroked his belly as he leaned back in his chair. Across his desk sat Lieutenant Anderson, who was earnestly pointing out high points on a chart.

"Here it is, Captain," Anderson said. "Ender's already got them doing a tactic that's going to throw off everyone who meets it. Doubled their speed."

Graff nodded.

"And you know his test scores. He thinks well, too."

Graff smiled. "All true, all true, Anderson, he's a fine student, shows real promise."

They waited.

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Graff sighed. "So what do you want me to do?"

"Ender's the one. He's got to be."

"He'll never be ready in time, Lieutenant. He's eleven, for heaven's sake, man, what do you want, a miracle?"

"I want him into battles, every day starting tomorrow. I want him to have a year's worth of battles in a month."

Graff shook his head. "That would have his army in the hospital."

"No sir. He's getting them into form. And we need Ender."

"Correction, Lieutenant. We need somebody. You think it's Ender."

"All right, I think it's Ender. Which of the commanders if it isn't him?"

"I don't know, Lieutenant." Graff ran his hands over his slightly fuzzy bald head. "These are children, Anderson. Do you realize that? Ender's army is nine years old. Are we going to put them against the older kids? Are we going to put them through hell for a month like that?"

Lieutenant Anderson leaned even further over Graff's desk.

"Ender's test scores, Captain!"

"I've seen his bloody test scores! I've watched him in battle, I've listened to tapes of his training sessions, I've watched his sleep patterns, I've heard tapes of his conversations in the corridors and in the bathrooms, I'm more aware of Ender Wiggins than you could possibly imagine! And against all the arguments, against his obvious qualities, I'm weighing one thing. I have this picture of Ender a year from now, if you have your way. I see him completely useless, worn down, a failure, because he was pushed farther than he or any living person could go. But it doesn't weigh enough, does it, Lieutenant, because there's a war on, and our best talent is gone, and the biggest battles are ahead. So give Ender a battle every day this week. And then bring me a report."

Anderson stood and saluted. "Thank you sir."

He had almost reached the door when Graff called his name. He turned and faced the captain.

"Anderson," Captain Graff said. "Have you been outside, lately I mean?"

"Not since last leave, six months ago."

"I didn't think so. Not that it makes any difference. But have you ever been to Beaman Park, there in the city? Hmm? Beautiful park. Trees. Grass. No nullo, no battles, no worries. Do you know what else there is in Beaman Park?"

"What, sir?" Lieutenant Anderson asked.

"Children," Graff answered.

"Of course children," said Anderson.

"I mean children. I mean kids who get up in the morning when their mothers call them and they go to school and then in the afternoons they go to Beaman Park and play. They're happy, they smile a lot, they laugh, they have fun. Hmmm?"

"I'm sure they do sir."

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"Is that all you can say, Anderson?"

Anderson cleared his throat. "It's good for children to have fun, I think, sir. I know I did when I was a boy. But right now the world needs soldiers. And this is the way to get them."

Graff nodded and closed his eyes. "Oh, indeed, you're right, by statistical proof and by all the important theories, and dammit they work and the system is right but all the same Ender's older than I am. He's not a child. He's barely a person."

"If that's true, sir, then at least we all know that Ender is making it possible for the others of his age to be playing in the park."

"And Jesus died to save all men, of course." Graff sat up and looked at Anderson almost sadly. "But we're the ones," Graff said, "We're the ones who are driving in the nails."

Ender Wiggins lay on his bed staring at the ceiling. He never slept more than five hours a night—but the lights went off at 2200 and didn't come on again until 0600. So he stared at the ceiling and thought. He'd had his army for three and a half weeks. Dragon Army. The name was assigned, and it wasn't a lucky one. Oh, the charts said that about nine years ago a Dragon Army had done fairly well. But for the next six years the name had been attached to inferior armies, and finally, because of the superstition that was beginning to play about the name, Dragon Army was retired. Until now. And now, Ender thought smiling, Dragon Army was going to take them by surprise.

The door opened softly. Ender did not turn his head. Someone stepped softly into his room, then left with the quiet sound of the door shutting. When soft steps died away Ender rolled over and saw a white slip of paper lying on the floor. He reached down and picked it up.

"Dragon Army against Rabbit Army, Ender Wiggins and Carn Carby, 0700."

The first battle. Ender got out of bed and quickly dressed. He went rapidly to the rooms of each of his toon leaders and told them to rouse their boys. In five minutes they were all gathered in the corridor, sleepy and slow. Ender spoke softly.

"First battle, 0700 against Rabbit Army. I've fought them twice before but they've got a new commander. Never heard of him. They're an older group, though, and I know a few of their old tricks. Now wake up. Run, doublefast, warmup in workroom three."

For an hour and a half they worked out, with three mockbattles and calisthenics in the corridor out of the nullo. Then for fifteen minutes they all lay up in the air, totally relaxing in the weightlessness. At 0650 Ender roused them and they hurried into the corridor. Ender led them down the corridor, running again, and occasionally leaping to touch a light panel on the ceiling. The boys all touched the same light panel. And at 0658 they reached their gate to the battleroom.

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The members of Toons C and D grabbed the first eight handholds in the ceiling of the corridor. Toons A, B, and E crouched on the floor. Ender hooked his feet into two handholds in the middle of the ceiling, so he was out of everyone's way.

"Which way is the enemy's door?" he hissed.

"Down!" they whispered back, and laughed.

"Flashers on." The boxes in their hands glowed green. They waited for a few seconds more, and then the gray wall in front of them disappeared and the battleroom was visible.

Ender sized it up immediately. The familiar open grid of the most early games, like the monkey bars at the park, with seven or eight boxes scattered through the grid. They called the boxes *stars*. There were enough of them, and in forward enough positions, that they were worth going for. Ender decided this in a second, and he hissed, "Spread to near stars. E hold!"

The four groups in the corners plunged through the forcefield at the doorway and fell down into the battleroom. Before the enemy even appeared through the opposite gate Ender's army had spread from the door to the nearest stars.

Then the enemy soldiers came through the door. From their stance Ender knew they had been in a different gravity, and didn't know enough to disorient themselves from it. They came through standing up, their entire bodies spread and defenseless.

"Kill 'em, E!" Ender hissed, and threw himself out the door knees first, with his flasher between his legs and firing. While Ender's group flew across the room the rest of Dragon Army lay down a protecting fire, so that E group reached a forward position with only one boy frozen completely, though they had all lost the use of their legs—which didn't impair them in the least. There was a lull as Ender and his opponent, Carn Carby, assessed their positions. Aside from Rabbit Army's losses at the gate, there had been few casualties, and both armies were near full strength. But Carn had no originality—he was in a four-corner spread that any five-year-old in the teacher squads might have thought of. And Ender knew how to defeat it.

He called out, loudly, "E covers A, C down. B, D angle east wall." Under E toon's cover, B and D toons lunged away from their stars. While they were still exposed, A and C toons left their stars and drifted toward the near wall. They reached it together, and together jackknifed off the wall. At double the normal speed they appeared behind the enemy's stars, and opened fire. In a few seconds the battle was over, with the enemy almost entirely frozen, including the commander, and the rest scattered to the corners. For the next five minutes, in squads of four, Dragon Army cleaned out the dark corners of the battleroom and shepherded the enemy into the center, where their bodies, frozen at impossible angles, jostled

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each other. Then Ender took three of his boys to the enemy gate and went through the formality of reversing the one-way field by simultaneously touching a Dragon Army helmet at each corner. Then Ender assembled his army in vertical files near the knot of frozen Rabbit Army soldiers.

Only three of Dragon Army's soldiers were immobile. Their victory margin—38 to 0—was ridiculously high, and Ender began to laugh. Dragon Army joined him, laughing long and loud. They were still laughing when Lieutenant Anderson and Lieutenant Morris came in from the teachergate at the south end of the battleroom.

Lieutenant Anderson kept his face stiff and unsmiling, but Ender saw him wink as he held out his hand and offered the stiff, formal congratulations that were ritually given to the victor in the game.

Morris found Carn Carby and unfroze him, and the thirteen-year-old came and presented himself to Ender, who laughed without malice and held out his hand. Carn graciously took Ender's hand and bowed his head over it. It was that or be flashed again.

Lieutenant Anderson dismissed Dragon Army, and they silently left the battleroom through the enemy's door—again part of the ritual. A light was blinking on the north side of the square door, indicating where the gravity was in that corridor. Ender, leading his soldiers, changed his orientation and went through the forcefield and into gravity on his feet. His army followed him at a brisk run back to the workroom. When they got there they formed up into squads, and Ender hung in the air, watching them.

"Good first battle," he said, which was excuse enough for a cheer, which he quieted. "Dragon Army did all right against Rabbits. But the enemy isn't always going to be that bad. And if that had been a good army we would have been smashed. We still would have won, but we would have been smashed. Now let me see B and D toons out here. Your takeoff from the stars was way too slow. If Rabbit Army knew how to aim a flasher, you all would have been frozen solid before A and C even got to the wall."

They worked out for the rest of the day.

That night Ender went for the first time to the commanders' mess hall. No one was allowed there until he had won at least one battle, and Ender was the youngest commander ever to make it. There was no great stir when he came in. But when some of the other boys saw the Dragon on his breast pocket, they stared at him openly, and by the time he got his tray and sat at an empty table, the entire room was silent, with the other commanders watching him. Intensely self-conscious, Ender wondered how they all knew, and why they all looked so hostile.

Then he looked above the door he had just come through. There was a huge scoreboard across the entire wall. It showed the win/loss record for

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the commander of every army; that day's battles were lit in red. Only four of them. The other three winners had barely made it—the best of them had only two men whole and eleven mobile at the end of the game. Dragon Army's score of thirty-eight mobile was embarrassingly better.

Other new commanders had been admitted to the commanders' mess hall with cheers and congratulations. Other new commanders hadn't won thirty-eight to zero.

Ender looked for Rabbit Army on the scoreboard. He was surprised to find that Carn Carby's score to date was eight wins and three losses. Was he that good? Or had he only fought against inferior armies? Whichever, there was still a zero in Carn's mobile and whole columns, and Ender looked down from the scoreboard grinning. No one smiled back, and Ender knew that they were afraid of him, which meant that they would hate him, which meant that anyone who went into battle against Dragon Army would be scared and angry and incompetent. Ender looked for Carn Carby in the crowd, and found him not too far away. He stared at Carby until one of the other boys nudged the Rabbit commander and pointed to Ender. Ender smiled again and waved slightly. Carby turned red, and Ender, satisfied, leaned over his dinner and began to eat.

At the end of the week Dragon Army had fought seven battles in seven days. The score stood 7 wins and 0 losses. Ender had never had more than five boys frozen in any game. It was no longer possible for the other commanders to ignore Ender. A few of them sat with him and quietly conversed about game strategies that Ender's opponents had used. Other much larger groups were talking with the commanders that Ender had defeated, trying to find out what Ender had done to beat them.

In the middle of the meal the teacher door opened and the groups fell silent as Lieutenant Anderson stepped in and looked over the group. When he located Ender he strode quickly across the room and whispered in Ender's ear. Ender nodded, finished his glass of water, and left with the lieutenant. On the way out, Anderson handed a slip of paper to one of the older boys. The room became very noisy with conversation as Anderson and Ender left.

Ender was escorted down corridors he had never seen before. They didn't have the blue glow of the soldier corridors. Most were wood paneled, and the floors were carpeted. The doors were wood, with nameplates on them, and they stopped at one that said, "Captain Graff, supervisor." Anderson knocked softly, and a low voice said, "Come in."

They went in. Captain Graff was seated behind a desk, his hands folded across his pot belly. He nodded, and Anderson sat. Ender also sat down. Graff cleared his throat and spoke.

"Seven days since your first battle, Ender."

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Ender did not reply.

"Won seven battles, one every day."

Ender nodded.

"Scores unusually high, too."

Ender blinked.

"Why?" Graff asked him.

Ender glanced at Anderson, and then spoke to the captain behind the desk. "Two new tactics, sir. Legs doubled up as a shield, so that a flash doesn't immobilize. Jackknife takeoffs from the walls. Superior strategy, as Lieutenant Anderson taught, think places, not spaces. Five toons of eight instead of four of ten. Incompetent opponents. Excellent toon leaders, good soldiers."

Graff looked at Ender without expression. Waiting for what, Ender thought. Lieutenant Anderson spoke.

"Ender, what's the condition of your army."

"A little tired, in peak condition, morale high, learning fast. Anxious for the next battle."

Anderson looked at Graff, and Graff shrugged slightly. Then he nodded, and Anderson smiled. Graff turned to Ender.

"Is there anything you want to know?"

Ender held his hands loosely in his lap. "When are you going to put us up against a good army?"

Anderson was surprised, and Graff laughed out loud. The laughter rang in the room, and when it stopped, Graff handed a piece of paper to Ender. "Now," the Captain said, and Ender read the paper.

"Dragon Army against Leopard Army, Ender Wiggins and Pol Slattery, 2000."

Ender looked up at Captain Graff. "That's ten minutes from now, sir."

Graff smiled. "Better hurry, then, boy."

As Ender left he realized Pol Slattery was the boy who had been handed his orders as Ender left the mess hall.

He got to his army five minutes later. Three toon leaders were already undressed and lying naked on their beds. He sent them all flying down the corridors to rouse their toons, and gathered up their suits himself. As all his boys were assembled in the corridor, most of them still getting dressed, Ender spoke to them.

"This one's hot and there's no time. We'll be late to the door, and the enemy'll be deployed right outside our gate. Ambush, and I've never heard of it happening before. So we'll take our time at the door. E toon, keep your belts loose, and give your flashers to the leaders and seconds of the other toons."

Puzzled, E toon complied. By then all were dressed, and Ender led them at a trot to the gate. When they reached it the forcefield was already on one-way, and some of his soldiers were panting. They had had one battle that day and a full workout. They were tired.

Ender stopped at the entrance and looked at the placement of the enemy soldiers. Most of them were grouped not more than twenty feet out from

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the gate. There was no grid, there were no stars. A big empty space. Where were the other enemy soldiers? There should have been ten more.

"They're flat against this wall," Ender said, "where we can't see them."

He thought for a moment, then took two of the toons and made them kneel, their hands on their hips. Then he flashed them, so that their bodies were frozen rigid.

"You're shields," Ender said, and then had boys from two other toons kneel on their legs, and hook both arms under the frozen boys' shoulders. Each boy was holding two flashers. Then Ender and the members of the last toon picked up the duos, three at a time, and threw them out the door.

Of course, the enemy opened fire immediately. But they only hit the boys who were already flashed, and in a few moments pandemonium broke out in the battleroom. All the soldiers of Leopard Army were easy targets as they lay pressed flat against the wall, and Ender's soldiers, armed with two flashers each, carved them up easily. Pol Slattery reacted quickly, ordering his men away from the wall, but not quickly enough—only a few were able to move, and they were flashed before they could get a quarter of the way across the battleroom.

When the battle was over Dragon Army had only twelve boys whole, the lowest score they had ever had. But Ender was satisfied. And during the ritual of surrender Pol Slattery broke form by shaking hands and asking, "Why did you wait so long getting out of the gate?"

Ender glanced at Anderson, who was floating nearby. "I was informed late," he said. "It was an ambush."

Slattery grinned, and gripped Ender's hand again. "Good game."

Ender didn't smile at Anderson this time. He knew that now the games would be arranged against him, to even up the odds. He didn't like it.

It was 2150, nearly time for lights out, when Ender knocked at the door of the room shared by Bean and three other soldiers. One of the others opened the door, then stepped back and held it wide. Ender stood for a moment, then asked if he could come in. They answered, of course, of course, come in, and he walked to the upper bunk, where Bean had set down his book and was leaning on one elbow to look at Ender.

"Bean, can you give me twenty minutes?"

"Near lights out," Bean answered.

"My room," Ender answered. "I'll cover for you." Bean sat up and slid off his bed. Together he and Ender padded silently down the corridor to Ender's room. Bean entered first, and Ender closed the door behind them.

"Sit down," Ender said, and they both sat on the edge of the bed, looking at each other.

"Remember four weeks ago, Bean? When you told me to make you a toon leader?"

"Yeah."

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"I've made five toon leaders since then, haven't I? And none of them was you."

Bean looked at him calmly.

"Was I right?" Ender asked.

"Yes, sir," Bean answered.

Ender nodded. "How have you done in these battles?"

Bean cocked his head to one side. "I've never been immobilized, sir, and I've immobilized forty-three of the enemy. I've obeyed orders quickly, and I've commanded a squad in mop-up and never lost a soldier."

"Then you'll understand this." Ender paused, then decided to back up and say something else first.

"You know you're early, Bean, by a good half year. I was, too, and I've been made a commander six months early. Now they've put me into battles after only three weeks of training with my army. They've given me eight battles in seven days. I've already had more battles than boys who were made commander four months ago. I've won more battles than many who've been commanders for a year. And then tonight. You know what happened tonight."

Bean nodded. "They told you late."

"I don't know what the teachers are doing, But my army is getting tired, and I'm getting tired, and now they're changing the rules of the game. You see, Bean, I've looked in the old charts. No one has ever destroyed so many enemies and kept so many of his own soldiers whole in the history of the game. I'm unique—and I'm getting unique treatment."

Bean smiled. "You're the best, Ender."

Ender shook his head. "Maybe. But it was no accident that I got the soldiers I got. My worst soldier could be a toon leader in another army. I've got the best. They've loaded things my way—but now they're loading it against me. I don't know why. But I know I have to be ready for it. I need your help."

"Why mine?"

"Because even though there are some better soldiers than you in Dragon Army—not many, but some—there's nobody who can think better and faster than you." Bean said nothing. They both knew it was true.

Ender continued, "I need to be ready, but I can't retrain the whole army. So I'm going to cut every toon down by one, including you—and you and four others will be a special squad under me. And you'll learn to do some new things. Most of the time you'll be in the regular toons just like you are now. But when I need you. See?"

Bean smiled and nodded. "That's right, that's good, can I pick them myself?"

"One from each toon except your own, and you can't take any toon leaders."

"What do you want us to do?"

"Bean, I don't know. I don't know what they'll throw at us. What would you do if suddenly our flashers didn't work, and the enemy's did? What would you do if we had to face two armies at once? The only thing I know

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is—we're not going for score anymore. We're going for the enemy's gate. That's when the battle is technically won—four helmets at the corners of the gate. I'm going for quick kills, battles ended even when we're outnumbered. Got it? You take them for two hours during regular workout. Then you and I and your soldiers, we'll work at night after dinner."

"We'll get tired."

"I have a feeling we don't know what tired is."

Ender reached out and took Bean's hand, and gripped it. "Even when it's rigged against us, Bean. We'll win."

Bean left in silence and padded down the corridor.

Dragon Army wasn't the only army working out after hours now. The other commanders finally realized they had some catching up to do. From early morning to lights out soldiers all over Training and Command Center, none of them over fourteen years old, were learning to jackknife off walls and use each other as living shields.

But while other commanders mastered the techniques that Ender had used to defeat them, Ender and Bean worked on solutions to problems that had never come up.

There were still battles every day, but for a while they were normal, with grids and stars and sudden plunges through the gate. And after the battles, Ender and Bean and four other soldiers would leave the main group and practice strange maneuvers. Attacks without flashers, using feet to physically disarm or disorient an enemy. Using four frozen soldiers to reverse the enemy's gate in less than two seconds. And one day Bean came to workout with a 300-meter cord.

"What's that for?"

"I don't know yet." Absently Bean spun one end of the cord. It wasn't more than an eighth of an inch thick, but it could have lifted ten adults without breaking.

"Where did you get it?"

"Commissary. They asked what for. I said to practice tying knots."

Bean tied a loop in the end of the rope and slid it over his shoulders.

"Here, you two, hang onto the wall here. Now don't let go of the rope. Give me about fifty yards of slack." They complied, and Bean moved about ten feet from them along the wall. As soon as he was sure they were ready, he jackknifed off the wall and flew straight out, fifty meters. Then the rope snapped taut. It was so fine that it was virtually invisible, but it was strong enough to force Bean to veer off at almost a right angle. It happened so suddenly that he had inscribed a perfect arc and hit the wall before most of the other soldiers knew what had happened. Bean did a perfect rebound and drifted quickly back where Ender and the others waited for him.

Many of the soldiers in the five regular squads hadn't noticed the rope, and were demanding to know how it was done. It was impossible to change direction that abruptly in nul-

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lo. Bean just laughed.

"Wait till the next game without a grid! They'll never know what hit them."

They never did. The next game was only two hours later, but Bean and two others had become pretty good at aiming and shooting while they flew at ridiculous speeds at the end of the rope. The slip of paper was delivered, and Dragon Army trotted off to the gate, to battle with Griffin Army. Bean coiled the rope all the way.

When the gate opened, all they could see was a large brown star only fifteen feet away, completely blocking their view of the enemy's gate.

Ender didn't pause. "Bean, give yourself fifty feet of rope and go around the star." Bean and his four soldiers dropped through the gate and in a moment Bean was launched sideways away from the star. The rope snapped taut, and Bean flew forward. As the rope was stopped by each edge of the star in turn, his arc became tighter and his speed greater, until when he hit the wall only a few feet away from the gate he was barely able to control his rebound to end up behind the star. But he immediately moved all his arms and legs so that those waiting inside the gate would know that the enemy hadn't flashed him anywhere.

Ender dropped through the gate, and Bean quickly told him how Griffin Army was situated. "They've got two squares of stars, all the way around the gate. All their soldiers are under cover, and there's no way to hit any of them until we're clear to the bottom wall. Even with shields, we'd get there at half strength and we wouldn't have a chance."

"They moving?" Ender asked.

"Do they need to?"

Ender thought for a moment. "This one's tough. We'll go for the gate, Bean."

Griffin Army began to call out to them.

"Hey, is anybody there!"

"Wake up, there's a war on!"

"We wanna join the picnic!"

They were still calling when Ender's army came out from behind their star with a shield of fourteen frozen soldiers. William Bee, Griffin Army's commander, waited patiently as the screen approached, his men waiting at the fringes of their stars for the moment when whatever was behind the screen became visible. About ten meters away the screen exploded as the soldiers behind it shoved the screen north. The momentum carried them south twice as fast, and at the same moment the rest of Dragon Army burst from behind their star at the opposite end of the room, firing rapidly.

William Bee's boys joined battle immediately, of course, but William Bee was far more interested in what had been left behind when the shield disappeared. A formation of four frozen Dragon Army soldiers was moving headfirst toward the Griffin Army gate, held together by another frozen soldier whose feet and hands were hooked through their belts. A

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sixth soldier hung to his wrist and trailed like the tail of a kite. Griffin Army was winning the battle easily, and William Bee concentrated on the formation as it approached the gate. Suddenly the soldier trailing in back moved—he wasn't frozen at all! And even though William Bee flashed him immediately, the damage was done. The formation drifted to the Griffin Army gate, and their helmets touched all four corners simultaneously. A buzzer sounded, the gate reversed, and the frozen soldier in the middle was carried by momentum right through the gate. All the flashers stopped working, and the game was over.

The teacher door opened and Lieutenant Anderson came in. Anderson stopped himself with a slight movement of his hands when he reached the center of the battleroom. "Ender," he called, breaking protocol. One of the frozen Dragon soldiers near the south wall tried to call through jaws that were clamped shut by the suit. Anderson drifted to him and unfroze him.

Ender was smiling.

"I beat you again, sir," Ender said. Anderson didn't smile.

"That's nonsense, Ender," Anderson said softly. "Your battle was with William Bee of Griffin Army."

Ender raised an eyebrow.

"After that maneuver," Anderson said, "the rules are being revised to require that all of the enemy's soldiers must be immobilized before the gate can be reversed."

"That's all right," Ender said. "It could only work once, anyway." Anderson nodded, and was turning away when Ender added, "Is there going to be a new rule that armies be given equal positions to fight from?"

Anderson turned back around. "If you're in one of the positions, Ender, you can hardly call them equal, whatever they are."

William Bee counted carefully and wondered how in the world he had lost when not one of his soldiers had been flashed, and only four of Ender's soldiers were even mobile.

And that night as Ender came into the commanders' mess hall, he was greeted with applause and cheers, and his table was crowded with respectful commanders, many of them two or three years older than he was. He was friendly, but while he ate he wondered what the teachers would do to him in his next battle. He didn't need to worry. His next two battles were easy victories, and after that he never saw the battleroom again.

It was 2100 and Ender was a little irritated to hear someone knock at his door. His army was exhausted, and he had ordered them all to be in bed after 2030. The last two days had been regular battles, and Ender was expecting the worst in the morning.

It was Bean. He came in sheepishly, and saluted.

Ender returned his salute and snapped, "Bean, I wanted everybody in bed."

Bean nodded but didn't leave.

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Ender considered ordering him out. But as he looked at Bean it occurred to him for the first time in weeks just how young Bean was. He had turned eight a week before, and he was still small and—no, Ender thought, he wasn't young. Nobody was young. Bean had been in battle, and with a whole army depending on him he had come through and won. And even though he was small, Ender could never think of him as young again.

Ender shrugged and Bean came over and sat on the edge of the bed. The younger boy looked at his hands for a while, and finally Ender grew impatient and asked, "Well, what is it?"

"I'm transferred. Got orders just a few minutes ago."

Ender closed his eyes for a moment. "I knew they'd pull something new. Now they're taking—where are you going?"

"Rabbit Army."

"How can they put you under an idiot like Carn Carby!"

"Carn was graduated. Support squads."

Ender looked up. "Well, who's commanding Rabbit then?"

Bean held his hands out helplessly. "Me," he said.

Ender nodded, and then smiled. "Of course, After all, you're only four years younger than the regular age."

"It isn't funny," Bean said. "I don't know what's going on here. First all the changes in the game. And now this. I wasn't the only one transferred, either, Ender. Ren, Peder, Wins, Younger, Paul. All commanders now."

Ender stood up angrily and strode to the wall. "Every damn toon leader I've got!" he said, and whirled to face Bean. "If they're going to break up my army, Bean, why did they bother making me a commander at all?"

Bean shook his head. "I don't know. You're the best, Ender. Nobody's ever done what you've done. Nineteen battles in fifteen days, sir, and you won every one of them, no matter what they did to you."

"And now you and the others are commanders. You know every trick I've got, I trained you, and who am I supposed to replace you with? Are they going to stick me with six greenohs?"

"It stinks, Ender, but you know that if they gave you five crippled midgets and armed you with a roll of toilet paper you'd win."

They both laughed, and then they noticed that the door was open.

Lieutenant Anderson stepped in. He was followed by Captain Graff.

"Ender Wiggins," Graff said, holding his hands across his stomach.

"Yes sir," Ender answered.

"Orders."

Anderson extended a slip of paper. Ender read it quickly, then crumpled it, still looking at the air where the paper had been. After a few moments he asked, "Can I tell my army?"

"They'll find out," Graff answered. "It's better not to talk to them after orders. It makes it easier."

"For you or for me?" Ender asked.

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He didn't wait for an answer. He turned to Bean, took his hand for a moment, and headed for the door.

"Wait," Bean said. "Where are you going? Tactical or Support School?"

"Command School," Ender answered, and then he was gone and Anderson closed the door.

Command School, Bean thought. Nobody went to Command School until they had gone through three years of Tactical. But then, nobody went to Tactical until they had been through at least five years of Battle School. Ender had only had three.

The system was breaking up. No doubt about it, Bean thought. Either somebody at the top was going crazy, or something was going wrong with the war—the real war, the one they were training to fight in. Why else would they break down the training system, advance somebody—even somebody as good as Ender—straight to Command School? Why else would they have an eight-year-old greenoh like Bean command an army?

Bean wondered about it for a long time, and then he finally lay down on Ender's bed and realized that he'd never see Ender again, probably. For some reason that made him want to cry. But he didn't cry, of course. Training in the preschools had taught him how to force down emotions like that. He remembered how his first teacher, when he was three, would have been upset to see his lip quivering and his eyes full of tears.

Bean went through the relaxing routine until he didn't feel like crying anymore. Then he drifted off to sleep. His hand was near his mouth. It lay on his pillow hesitantly, as if Bean couldn't decide whether to bite his nails or suck on his fingertips. His forehead was creased and furrowed. His breathing was quick and light. He was a soldier, and if anyone had asked him what he wanted to be when he grew up, he wouldn't have known what they meant.

There's a war on, they said, and that was excuse enough for all the hurry in the world. They said it like a password and flashed a little card at every ticket counter and customs check and guard station. It got them to the head of every line.

Ender Wiggin was rushed from place to place so quickly he had no time to examine anything. But he did see trees for the first time. He saw men who were not in uniform. He saw women. He saw strange animals that didn't speak, but that followed docilely behind women and small children. He saw suitcases and conveyor belts and signs that said words he had never heard of. He would have asked someone what the words meant, except that purpose and authority surrounded him in the persons of four very high officers who never spoke to each other and never spoke to him.

Ender Wiggin was a stranger to his world he was being trained to save. He did not remember ever leaving Battle School before. His earliest memories were of childish war games under the direction of a teacher, of meals with

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other boys in the gray and green uniforms of the armed forces of his world. He did not know that the gray represented the sky and the green represented the great forests of his planet. All he knew of the world was from vague references to "outside."

And before he could make any sense of the strange world he was seeing for the first time, they enclosed him again within the shell of the military, where nobody had to say there's a war on anymore because nobody in the shell of the military forgot it for a single instant in a single day.

They put him in a space ship and launched him to a large artificial satellite that circled the world.

This space station was called Command School. It held the ansible.

On his first day Ender Wiggin was taught about the ansible and what it meant to warfare. It meant that even though the starships of today's battles were launched a hundred years ago, the commanders of the starships were men of today, who used the ansible to send messages to the computers and the few men on each ship. The ansible sent words as they were spoken, orders as they were made. Battleplans as they were fought. Light was a pedestrian.

For two months Ender Wiggin didn't meet a single person. They came to him namelessly, taught him what they knew, and left him to other teachers. He had no time to miss his friends at Battle School. He only had time to learn how to operate the simulator, which flashed battle patterns around him as if he were in a starship at the center of the battle. How to command mock ships in mock battles by manipulating the keys on the simulator and speaking words into the ansible. How to recognize instantly every enemy ship and the weapons it carried by the pattern that the simulator showed. How to transfer all that he learned in the nullo battles at Battle School to the starship battles at Command School.

He had thought the game was taken seriously before. Here they hurried him through every step, were angry and worried beyond reason every time he forgot something or made a mistake. But he worked as he had always worked, and learned as he had always learned. After a while he didn't make any more mistakes. He used the simulator as if it were a part of himself. Then they stopped being worried and they gave him a teacher. The teacher was a person at last, and his name was Maezr Rackham.

Maezr Rackham was sitting cross-legged on the floor when Ender awoke. He said nothing as Ender got up and showered and dressed, and Ender did not bother to ask him anything. He had long since learned that when something unusual was going on, he would find out more information faster by waiting than by asking.

Maezr still hadn't spoken when Ender was ready and went to the door to leave the room. The door didn't open. Ender turned to face the man

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sitting on the floor. Maezr was at least forty, which made him the oldest man Ender had ever seen close up. He had a day's growth of black and white whiskers that grizzled his face only slightly less than his close-cut hair. His face sagged a little and his eyes were surrounded by creases and lines. He looked at Ender without interest.

Ender turned back to the door and tried again to open it.

"All right," he said, giving up. "Why's the door locked?"

Maezr continued to look at him blankly.

Ender became impatient. "I'm going to be late. If I'm not supposed to be there until later, then tell me so I can go back to bed." No answer. "Is it a guessing game?" Ender asked. No answer. Ender decided that maybe the man was trying to make him angry, so he went through a relaxing exercise as he leaned on the door, and soon he was calm again. Maezr didn't take his eyes off Ender.

For the next two hours the silence endured, Maezr watching Ender constantly, Ender trying to pretend he didn't notice the old man. The boy became more and more nervous, and finally ended up walking from one end of the room to the other in a sporadic pattern.

He walked by Maezr as he had several times before, and Maezr's hand shot out and pushed Ender's left leg into his right in the middle of a step. Ender fell flat on the floor.

He leaped to his feet immediately, furious. He found Maezr sitting calmly, cross-legged, as if he had never moved. Ender stood poised to fight. But the other's immobility made it impossible for Ender to attack, and he found himself wondering if he had only imagined the old man's hand tripping him up.

The pacing continued for another hour, with Ender Wiggin trying the door every now and then. At last he gave up and took off his uniform and walked to his bed.

As he leaned over to pull the covers back, he felt a hand jab roughly between his thighs and another hand grab his hair. In a moment he had been turned upside down. His face and shoulders were being pressed into the floor by the old man's knee, while his back was excruciatingly bent and his legs were pinioned by Maezr's arm. Ender was helpless to use his arms, and he couldn't bend his back to gain slack so he could use his legs. In less than two seconds the old man had completely defeated Ender Wiggin.

"All right," Ender gasped. "You win."

Maezr's knee thrust painfully downward.

"Since when," Maezr asked in a soft, rasping voice, "do you have to tell the enemy when he has won?"

Ender remained silent.

"I surprised you once, Ender Wiggin. Why didn't you destroy me immediately afterward? Just because I looked peaceful? You turned your back on me. Stupid. You have learned nothing. You have never had a teacher."

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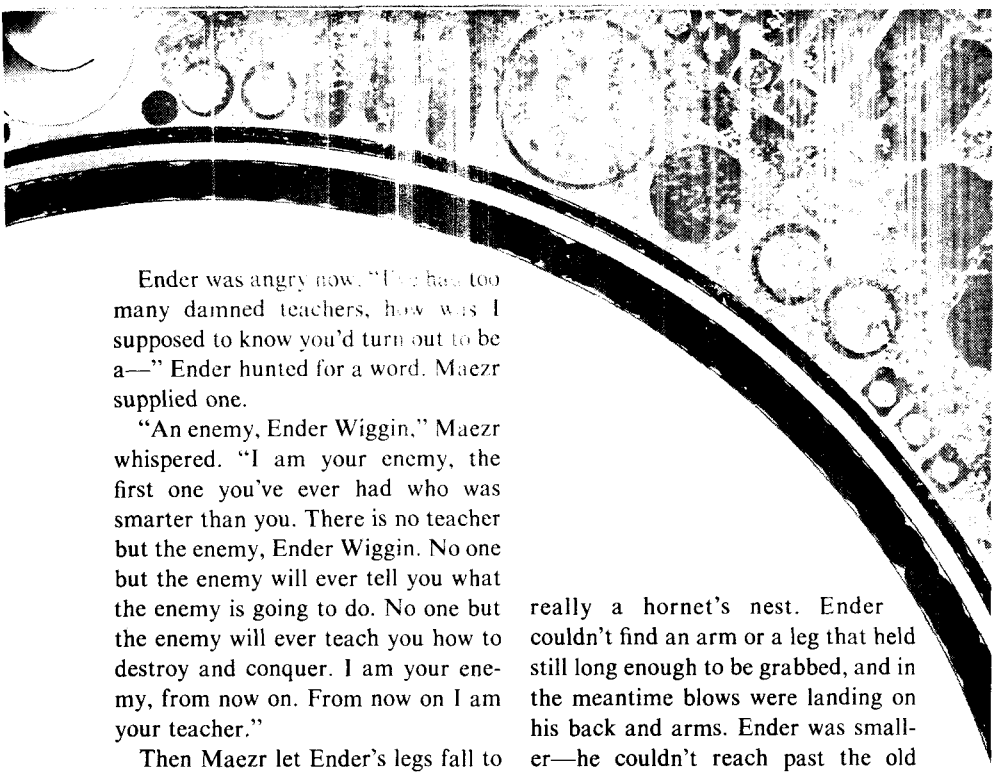

Ender was angry now. "I've had too many damned teachers, how was I supposed to know you'd turn out to be a—" Ender hunted for a word. Maezr supplied one.

"An enemy, Ender Wiggin," Maezr whispered. "I am your enemy, the first one you've ever had who was smarter than you. There is no teacher but the enemy, Ender Wiggin. No one but the enemy will ever tell you what the enemy is going to do. No one but the enemy will ever teach you how to destroy and conquer. I am your enemy, from now on. From now on I am your teacher."

Then Maezr let Ender's legs fall to the floor. Because the old man still held Ender's head to the floor, the boy couldn't use his arms to compensate, and his legs hit the plastic surface with a loud crack and a sickening pain that made Ender wince. Then Maezr stood and let Ender rise.

Slowly the boy pulled his legs under him, with a faint groan of pain, and he knelt on all fours for a moment, recovering. Then his right arm flashed out. Maezr quickly danced back and Ender's hand closed on air as his teacher's foot shot forward to catch Ender on the chin.

Ender's chin wasn't there. He was lying flat on his back, spinning on the floor, and during the moment that Maezr was off balance from his kick Ender's feet smashed into Maezr's other leg. The old man fell on the ground in a heap.

What seemed to be a heap was really a hornet's nest. Ender couldn't find an arm or a leg that held still long enough to be grabbed, and in the meantime blows were landing on his back and arms. Ender was smaller—he couldn't reach past the old man's flailing limbs.

So he leaped back out of the way and stood poised near the door.

The old man stopped thrashing about and sat up, cross-legged again, laughing. "Better, this time, boy. But slow. You will have to be better with a fleet than you are with your body or no one will be safe with you in command. Lesson learned?"

Ender nodded slowly.

Maezr smiled. "Good. Then we'll never have such a battle again. All the rest with the simulator. I will program your battles, I will devise the strategy of your enemy, and you will learn to be quick and discover what tricks the enemy has for you. Remember, boy. From now on the enemy is more clever than you. From now on the enemy is stronger than you. From now on you are always about to lose."

Then Maezr's face became serious

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again. "You will be about to lose, Ender, but you will win. You will learn to defeat the enemy. He will teach you how."

Maezr got up and walked toward the door. Ender stepped back out of the way. As the old man touched the handle of the door, Ender leaped into the air and kicked Maezr in the small of the back with both feet. He hit hard enough that he rebounded onto his feet, as Maezr cried out and collapsed on the floor.

Maezr got up slowly, holding onto the door handle, his face contorted with pain. He seemed disabled, but Ender didn't trust him. He waited warily. And yet in spite of his suspicion he was caught off guard by Maezr's speed. In a moment he found himself on the floor near the opposite wall, his nose and lip bleeding where his face had hit the bed. He was able to turn enough to see Maezr open the door and leave. The old man was limping and walking slowly.

Ender smiled in spite of the pain, then rolled over onto his back and laughed until his mouth filled with blood and he started to gag. Then he got up and painfully made his way to the bed. He lay down and in a few minutes a medic came and took care of his injuries.

As the drug had its effect and Ender drifted off to sleep he remembered the way Maezr limped out of his room and laughed again. He was still laughing softly as his mind went blank and the medic pulled the blanket over him and snapped off the light. He slept until pain woke him in the morning. He dreamed of defeating Maezr.

The next day Ender went to the simulator room with his nose bandaged and his lip still puffy. Maezr was not there. Instead a captain who had worked with him before showed him an addition that had been made. The captain pointed to a tube with a loop at one end. "Radio. Primitive, I know, but it loops over your ear and we tuck the other end into your mouth with this piece here . . ."

"Watch it," Ender said as the captain pushed the end of the tube into his swollen lip.

"Sorry. Now you just talk."

"Good. Who to?"

The captain smiled. "Ask and see."

Ender shrugged and turned to the simulator. As he did a voice reverberated through his skull. It was too loud for him to understand, and he ripped the radio off his ear.

"What are you trying to do, make me deaf?"

The captain shook his head and turned a dial on a small box on a nearby table. Ender put the radio back on.

"Commander," the radio said in a familiar voice. Ender answered, "Yes."

"Instructions, sir?"

The voice was definitely familiar. "Bean?" Ender asked.

"Yes sir."

"Bean, this is Ender."

Silence. And then a burst of laughter from the other side. Then six or

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seven more voices laughing, and Ender waited for silence to return. When it did, he asked, "Who else?" A few voices spoke at once, but Bean drowned them out. "Me, I'm Bean, and Peder, Wins, Younger, Lee, and Vlad."

Ender thought for a moment. Then asked what the hell was going on. They laughed again.

"They can't break up the group," Bean said. "We were commanders for maybe two weeks, and here we are at Command School, training with the simulator, and all of a sudden they told us we were going to form a fleet with a new commander. And that's you."

Ender smiled. "Are you boys any good?"

"If we aren't, you'll let us know."

Ender chuckled a little. "Might work out. A fleet."

For the next ten days Ender trained his toon leaders until they could maneuver their ships like precision dancers. It was like being back in the battleroom again, except that Ender could always see everything, and could speak to his toon leaders and change their orders at any time.

One day as Ender sat down at the control board and switched on the simulator, harsh green lights appeared in the space—the enemy.

"This is it," Ender said. "X, Y, bullet, C, D, reserve screen, E, south loop, Bean, angle north."

The enemy was grouped in a globe, and outnumbered Ender two to one. Half of Ender's force was grouped in a tight, bulletlike formation, with the rest in a flat circular screen—except for a tiny force under Bean that moved off the simulator, heading behind the enemy's formation. Ender quickly learned the enemy's strategy: whenever Ender's bullet formation came close, the enemy would give way, hoping to draw Ender inside the globe where he would be surrounded. So Ender obligingly fell into the trap, bringing his bullet to the center of the globe.

The enemy began to contract slowly, not wanting to come within range until all their weapons could be brought to bear at once. Then Ender began to work in earnest. His reserve screen approached the outside of the globe, and the enemy began to concentrate his forces there. Then Bean's force appeared on the opposite side, and the enemy again deployed ships on that side.

Which left most of the globe only thinly defended. Ender's bullet attacked, and since at the point of attack it outnumbered the enemy overwhelmingly, he tore a hole in the formation. The enemy reacted to try to plug the gap, but in the confusion the reserve force and Bean's small force attacked simultaneously, while the bullet moved to another part of the globe. In a few more minutes the formation was shattered, most of the enemy ships destroyed, and the few survivors rushing away as fast as they could go.

Ender switched the simulator off. All the lights faded. Maezr was stand-

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ing beside Ender, his hands in his pockets, his body tense. Ender looked up at him.

"I thought you said the enemy would be smart," Ender said.

Maezr's face remained expressionless. "What did you learn?"

"I learned that a sphere only works if your enemy's a fool. He had his forces so spread out that I outnumbered him whenever I engaged him."

"And?"

"And," Ender said, "You can't stay committed to one pattern. It makes you too easy to predict."

"Is that all?" Maezr asked quietly.

Ender took off his radio. "The enemy could have defeated me by breaking the sphere earlier."

Maezr nodded. "You had an unfair advantage."

Ender looked up at him coldly. "I was outnumbered two to one."

Maezr shook his head. "You have the ansible. The enemy doesn't. We include that in the mock battles. Their messages travel at the speed of light."

Ender glanced toward the simulator. "Is there enough space to make a difference?"

"Don't you know?" Maezr asked. "None of the ships was ever closer than thirty thousand kilometers to another."

Ender tried to figure the size of the enemy's sphere. Astronomy was beyond him. But now his curiosity was stirred.

"What kind of weapons are on those ships? To be able to strike so fast and so far apart?"

Maezr shook his head. "The science is too much for you. You'd have to study many more years than you've lived to understand even the basics. All you need to know is that the weapons work."

"Why do we have to come so close to be in range?"

"The ships are all protected by force fields. A certain distance away the weapons are weaker, and can't get through. Closer in the weapons are stronger than the shields. But the computers take care of all that. They're constantly firing in any direction that won't hurt one of our ships. The computers pick targets, aim, they do all the detail work. You just tell them when and get them in a position to win. All right?"

"No." Ender twisted the tube of the radio around his fingers. "I have to know how the weapons work."

"I told you, it would take—"

"I can't command a fleet—not even on the simulator—unless I know." Ender waited a moment, then added, "Just the rough idea."

Maezr stood up and walked a few steps away. "All right, Ender. It won't make any sense, but I'll try. As simply as I can." He shoved his hands into his pockets. "It's this way, Ender. Everything is made up of atoms, little particles so small you can't see them with your eyes. These atoms, there are only a few different types, and they're all made up of even smaller particles that are pretty much the same. These atoms can be broken, so that they stop

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being atoms. So that this metal doesn't hold together anymore. Or the plastic floor. Or your body. Or even the air. They just seem to disappear, if you break the atoms. All that's left is the pieces. And they fly around and break more atoms. The weapons on the ships set up an area where it's impossible for atoms of anything to stay together. They all break down. So things in that area—they disappear."

Ender nodded. "You're right, I don't understand it. Can it be blocked?"

"No. But it gets wider and weaker the farther it goes from the ship, so that after a while a force field will block it. Okay? And to make it strong at all, it has to be focused, so that a ship can only fire effectively in maybe three or four directions at once."

Ender nodded again. Maezr wondered if the boy really understood it at all.

"If the pieces of the broken atoms go breaking more atoms, why doesn't it just make everything disappear?"

"Space. Those thousands of kilometers between the ships, they're empty. Almost no atoms. The pieces don't hit anything, and when they finally do hit something, they're so spread out they can't do any harm." Maezr cocked his head quizzically. "Anything else . . . ?"

Ender nodded. "Do the weapons on the ships—do they work against anything besides ships?"

Maezr moved in close to Ender and said firmly, "We only use them against ships. Never anything else. If we used them against anything else, the enemy would use them against us. Got it?"

Maezr walked away, and was nearly out the door when Ender called to him.

"I don't know your name yet," Ender said blandly.

"Maezr Rackham."

"Maezr Rackham," Ender said, "I defeated you."

Maezr laughed.

"Ender, you weren't fighting me today," he said. "You were fighting the stupidest computer in the Command School, set on a ten-year-old program. You don't think I'd use a sphere, do you?" He shook his head. "Ender, my dear little fellow, when you fight me you'll know it. Because you'll lose." And Maezr left the room.

Ender still practiced ten hours a day with his toon leaders. He never saw them, though, only heard their voices on the radio. Battles came every two or three days. The enemy had something new every time, something harder—but Ender coped with it. And won every time. And after every battle Maezr would point out mistakes and show Ender had really lost. Maezr only let Ender finish so that he would learn to handle the end of the game.

Until finally Maezr came in and solemnly shook Ender's hand and said, "That, boy, was a good battle."

Because the praise was so long in

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coming, it pleased Ender more than praise had ever pleased him before. And because it was so condescending, he resented it.

"So from now on," Maezr said, "we can give you hard ones."

From then on Ender's life was a slow nervous breakdown.

He began fighting two battles a day, with problems that steadily grew more difficult. He had been trained in nothing but the game all his life—but now the game began to consume him. He woke in the morning with new strategies for the simulator, and went fitfully to sleep at night with the mistakes of the day preying on him. Sometimes he would wake up in the middle of the night crying for a reason he didn't remember. Sometimes he woke with his knuckles bloody from biting them. But every day he went impassively to the simulator and drilled his tooh leaders until the battles, and drilled his toon leaders after the battles, and endured and studied the harsh criticism that Maezr Rackham piled on him. He noted that Rackham perversely criticized him more after his hardest battles. He noted that every time he thought of a new strategy the enemy was using it within a few days. And he noted that while his fleet always stayed the same size, the enemy increased in numbers every day.

He asked his teacher.

"We are showing you what it will be like when you really command. The ratios of enemy to us."

"Why does the enemy always outnumber us in these battles?"

Maezr bowed his gray head for a moment, as if deciding whether to answer. Finally he looked up and reached out his hand and touched Ender on the shoulder. "I will tell you, even though the information is secret. You see, the enemy attacked us first. He had good reason to attack us, but that is a matter for politicians, and whether the fault was ours or his, we could not let him win. So when the enemy came to our worlds, we fought back, hard, and spent the finest of our young men in the fleets. But we won, and the enemy retreated."

Maezr smiled ruefully. "But the enemy was not through, boy. The enemy would never be through. They came again, with more numbers, and it was harder to beat them. And another generation of young men was spent. Only a few survived. So we came up with a plan—the big men came up with the plan. We knew that we had to destroy the enemy once and for all, totally, eliminate his ability to make war against us. To do that we had to go to his home worlds—his home world, really, since the enemy's empire is all tied to his capital world."

"And so?" Ender asked.

"And so we made a fleet. We made more ships than the enemy ever had. We made a hundred ships for every ship he had sent against us. And we launched them against his twenty-eight worlds. They left a hundred years ago. And they carried on them the ansible, and only a few men. So

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that someday a commander could sit on a planet somewhere far from the battle and command the fleet. So that our best minds would not be destroyed by the enemy."

Ender's question had still not been answered.

"Why do they outnumber us?"

Maezr laughed. "Because it took a hundred years for our ships to get there. They've had a hundred years to prepare for us. They'd be fools, don't you think, boy, if they waited in old tugboats to defend their harbors. They have new ships, great ships, hundreds of ships. All we have is the ansible, that and the fact that they have to put a commander with every fleet, and when they lose—and they will lose—they lose one of their best minds every time."

Ender started to ask another question.

"No more, Ender Wiggin. I've told you more than you ought to know as it is."

Ender stood angrily and turned away. "I have a right to know. Do you think this can go on forever, pushing me through one school and another and never telling me what my life is for? You use me and the others as a tool, someday we'll command your ships, someday maybe we'll save your lives, but I'm not a computer, and I have to *know!*"

"Ask me a question, then, boy," Maezr said, "and if I can answer, I will."

"If you use your best minds to command the fleets, and you never lose any, then what do you need me for? Who am I replacing, if they're all still there?"

Maezr shook his head. "I can't tell you the answer to that, Ender. Be content that we will need you, soon. It's late. Go to bed. You have a battle in the morning."

Ender walked out of the simulator room. But when Maezr left by the same door a few moments later, the boy was waiting in the hall.

"All right, boy," Maezr said impatiently, "what is it? I don't have all night and you need to sleep."

Ender stayed silent, but Maezr waited. Finally the boy asked softly, "Do they live?"

"Does who live?"

"The other commanders. The ones now. And before me."

Maezr snorted. "Live. Of course they live. He wonders if they live." Still chuckling the old man walked off down the hall. Ender stood in the corridor for a while, but at last he was tired and he went off to bed. They live, he thought. They live, but he can't tell me what happens to them.

That night Ender didn't wake up crying. But he did wake up with blood on his hands.

Months wore on with battles every day, until at last Ender settled into the routine of the destruction of himself. He slept less every night, dreamed more, and he began to have terrible pains in his stomach. They put him on a very bland diet, but soon he didn't even have an appetite for that. "Eat,"

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Maezr said, and Ender would mechanically put food in his mouth. But if nobody told him to eat he didn't eat.

One day as he was drilling his toon leaders the room went black and he woke up on the floor with his face bloody where he had hit the controls.

They put him to bed then, and for three days he was very ill. He remembered seeing faces in his dreams, but they weren't real faces, and he knew it even while he thought he saw them. He thought he saw Bean, sometimes, and sometimes he thought he saw Lieutenant Anderson and Captain Graff. And then he woke up and it was only his enemy, Maezr Rackham.

"I'm awake," he said to Maezr.

"So I see," Maezr answered. "Took you long enough. You have a battle today."

So Ender got up and fought the battle and he won it. But there was no second battle that day, and they let him go to bed earlier. His hands were shaking as he undressed.

During the night he thought he felt hands touching him gently, and he dreamed he heard voices, saying, "How long can he go on?"

"Long enough."

"So soon?"

"In a few days, then he's through."

"How will he do?"

"Fine. Even today, he was better than ever."

Ender recognized the last voice as Maezr Rackham's. He resented Rackham's intruding even in his sleep.

He woke up and fought another battle and won.

Then he went to bed.

He woke up and won again.

And the next day was his last day in Command School, though he didn't know it. He got up and went to the simulator for the battle.

Maezr was waiting for him. Ender walked slowly into the simulator room. His step was slightly shuffling, and he seemed tired and dull. Maezr frowned.

"Are you awake, boy?" If Ender had been alert, he would have noticed the concern in his teacher's voice. Instead, he simply went to the controls and sat down. Maezr spoke to him.

"Today's game needs a little explanation, Ender Wiggin. Please turn around and pay strict attention."

Ender turned around, and for the first time he noticed that there were people at the back of the room. He recognized Graff and Anderson from Battle School, and vaguely remembered a few of the men from Command School—teachers for a few hours at some time or another. But most of the people he didn't know at all.

"Who are they?"

Maezr shook his head and answered, "Observers. Every now and then we let observers come in to watch the battle. If you don't want them, we'll send them out."

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Ender shrugged. Maezr began his explanation. "Today's game, boy, has a new element. We're staging this battle around a planet. This will complicate things in two ways. The planet isn't large, on the scale we're using, but the ansible can't detect anything on the other side of it—so there's a blind spot. Also, it's against the rules to use weapons against the planet itself. All right?"

"Why, don't the weapons work against planets?"

Maezr answered coldly, "There are rules of war, Ender, that apply even in training games."

Ender shook his head slowly. "Can the planet attack?"

Maezr looked nonplussed for a moment, then smiled. "I guess you'll have to find that one out, boy. And one more thing. Today, Ender, your opponent isn't the computer. I am your enemy today, and today I won't be letting you off so easily. Today is a battle to the end. And I'll use any means I can to defeat you."

Then Maezr was gone, and Ender expressionlessly led his toon leaders through maneuvers. Ender was doing well, of course, but several of the observers shook their heads, and Graff kept clasping and unclasping his hands, crossing and uncrossing his legs. Ender would be slow today, and today Ender couldn't afford to be slow.

A warning buzzer sounded, and Ender cleared the simulator board, waiting for today's game to appear. He felt muddled today, and wondered why people were there watching. Were they going to judge him today? Decide if he was good enough for something else? For another two years of grueling training, another two years of struggling to exceed his best? Ender was twelve. He felt very old. And as he waited for the game to appear, he wished he could simply lose it, lose the battle badly and completely so that they would remove him from the program, punish him however they wanted, he didn't care, just so he could sleep.

Then the enemy formation appeared, and Ender's weariness turned to desperation.

The enemy outnumbered him a thousand to one, the simulator glowed green with them, and Ender knew that he couldn't win.

And the enemy was not stupid. There was no formation that Ender could study and attack. Instead the vast swarms of ships were constantly moving, constantly shifting from one momentary formation to another, so that a space that for one moment was empty was immediately filled with a formidable enemy force. And even though Ender's fleet was the largest he had ever had, there was no place he could deploy it where he would outnumber the enemy long enough to accomplish anything.

And behind the enemy was the planet. The planet, which Maezr had warned him about. What difference did a planet make, when Ender couldn't hope to get near it? Ender waited, waited for the flash of insight

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that would tell him what to do, how to destroy the enemy. And as he waited, he heard the observers behind him begin to shift in their seats, wondering what Ender was doing, what plan he would follow. And finally it was obvious to everybody that Ender didn't know what to do, that there was nothing to do, and a few of the men at the back of the room made quiet little sounds in their throats.

Then Ender heard Bean's voice in his ear. Bean chuckled and said, "Remember, the enemy's gate is *down*." A few of the other leaders laughed, and Ender thought back to the simple games he had played and won in Battle School. They had put him against hopeless odds there, too. And he had beaten them. And he'd be damned if he'd let Maezr Rackham beat him with a cheap trick like outnumbering him a thousand to one. He had won a game in Battle School by going for something the enemy didn't expect, something against the rules—he had won by going against the enemy's gate.

And the enemy's gate was down.

Ender smiled, and realized that if he broke this rule they'd probably kick him out of school, and that way he'd win for sure: he would never have to play a game again.

He whispered into the microphone. His six commanders each took part of the fleet and launched themselves against the enemy. They pursued erratic courses, darting off in one direction and then another. The enemy immediately stopped his aimless maneuvering and began to group around Ender's six fleets.

Ender took off his microphone, leaned back in his chair, and watched. The observers murmured out loud, now. Ender was doing nothing—he had thrown the game away.

But a pattern began to emerge from the quick confrontations with the enemy. Ender's six groups lost ships constantly as they brushed with each enemy force—but they never stopped for a fight, even when for a moment they could have won a small tactical victory. Instead they continued on their erratic course that led, eventually, down. Toward the enemy planet.

And because of their seemingly random course the enemy didn't realize it until the same time that the observers did. By then it was too late, just as it had been too late for William Bee to stop Ender's soldiers from activating the gate. More of Ender's ships could be hit and destroyed, so that of the six fleets only two were able to get to the planet, and those were decimated. But those tiny groups *did* get through, and they opened fire on the planet.

Ender leaned forward now, anxious to see if his guess would pay off. He half expected a buzzer to sound and the game to be stopped, because he had broken the rule. But he was betting on the accuracy of the simulator. If it could simulate a planet, it could simulate what would happen to a planet under attack.

It did.

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The weapons that blew up little ships didn't blow up the entire planet at first. But they did cause terrible explosions. And on the planet there was no space to dissipate the chain reaction. On the planet the chain reaction found more and more fuel to feed it.

The planet's surface seemed to be moving back and forth, but soon the surface gave way in an immense explosion that sent light flashing in all directions. It swallowed up Ender's entire fleet. And then it reached the enemy ships.

The first simply vanished in the explosion. Then, as the explosion spread and became less bright, it was clear what happened to each ship. As the light reached them they flashed brightly for a moment and disappeared. They were all fuel for the fire of the planet.

It took more than three minutes for the explosion to reach the limits of the simulator, and by then it was much fainter. All the ships were gone, and if any had escaped before the explosion reached them, they were few and not worth worrying about. Where the planet had been there was nothing. The simulator was empty.

Ender had destroyed the enemy by sacrificing his entire fleet and breaking the rule against destroying the planet. He wasn't sure whether to feel triumphant at his victory or defiant at the rebuke he was certain would come. So instead he felt nothing. He was tired. He wanted to go to bed and sleep.

He switched off the simulator, and finally heard the noise behind him.

There were no longer two rows of dignified military observers. Instead there was chaos. Some of them were slapping each other on the back, some of them were bowed with their head in their hands, others were openly weeping. Captain Graff detached himself from the group and came to Ender. Tears streamed down his face, but he was smiling. He reached out his arms, and to Ender's surprise he embraced the boy, held him tightly, and whispered, "Thank you, thank you, thank you, Ender."

Soon all the observers were gathered around the bewildered child, thanking him and cheering him and patting him on the shoulder and shaking his hand. Ender tried to make sense of what they were saying. He had passed the test after all? Why did it matter so much to them?

Then the crowd parted and Maezr Rackham walked through. He came straight up to Ender Wiggin and held out his hand.

"You made the hard choice, boy. But heaven knows there was no other way you could have done it. Congratulations. You beat them, and it's all over."

All over. Beat them. "I beat *you,* Maezr Rackham."

Maezr laughed, a loud laugh that filled the room. "Ender Wiggin, you never played me. You never played a *game* since I was your teacher."

Ender didn't get the joke. He had played a great many games, at a

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terrible cost to himself. He began to get angry.

Maezr reached out and touched his shoulder. Ender shrugged him off. Maezr then grew serious and said, "Ender Wiggin, for the last months you have been the commander of our fleets. There were no games. The battles were real. Your only enemy was *the* enemy. You won every battle. And finally today you fought them at their home world, and you destroyed their world, their fleet, you destroyed them completely, and they'll never come against us again. You did it. You."

Real. Not a game. Ender's mind was too tired to cope with it all. He walked away from Maezr, walked silently through the crowd that still whispered thanks and congratulations to the boy, walked out of the simulator room and finally arrived in his bedroom and closed the door.

He was asleep when Graff and Maezr Rackham found him. They came in quietly and roused him. He woke slowly, and when he recognized them he turned away to go back to sleep.

"Ender," Graff said. "We need to talk to you."

Ender rolled back to face them. He said nothing.

Graff smiled. "It was a shock to you yesterday, I know. But it must make you feel good to know you won the war."

Ender nodded slowly.

"Maezr Rackham here, he never played against you. He only analyzed your battles to find out your weak spots, to help you improve. It worked, didn't it?"

Ender closed his eyes tightly. They waited. He said, "Why didn't you tell me?"

Maezr smiled. "A hundred years ago, Ender, we found out some things. That when a commander's life is in danger he becomes afraid, and fear slows down his thinking. When a commander knows that he's killing people, he becomes cautious or insane, and neither of those help him do well. And when he is mature, when he has responsibilities and an understanding of the world, he becomes cautious and sluggish and can't do his job. So we trained children, who didn't know anything but the game, and never knew when it would become real. That was the theory, and you proved that the theory worked."

Graff reached out and touched Ender's shoulder. "We launched the ships so that they would all arrive at their destination during these few months. We knew that we'd probably only have one good commander, if we were lucky. In history it's been very rare to have more than one genius in a war. So we planned on having a genius. We were gambling. And you came along and we won."

Ender opened his eyes again and they realized he was angry. "Yes, you won."

Graff and Maezr Rackham looked at each other. "He doesn't understand," Graff whispered.

"I understand," Ender said. "You

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needed a weapon, and you got it, and it was me."

"That's right," Maezr answered.

"So tell me," Ender went on, "How many people lived on that planet that I destroyed."

They didn't answer him. They waited a while in silence, and then Graff spoke. "Weapons don't need to understand what they're pointed at, Ender. We did the pointing, and so we're responsible. You just did your job."

Maezr smiled. "Of course, Ender,

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you'll be taken care of. The government will never forget you. You served us all very well."

Ender rolled over and faced the wall, and even though they tried to talk to him, he didn't answer them. Finally they left.

Ender lay in his bed for a long time before anyone disturbed him again. The door opened softly. Ender didn't turn to see who it was. Then a hand touched him softly.

"Ender, it's me, Bean."

Ender turned over and looked at the little boy who was standing by his bed.

"Sit down," Ender said.

Bean sat. "That last battle, Ender. I didn't know how you'd get us out of it."

Ender smiled. "I didn't. I cheated. I thought they'd kick me out."

"Can you believe it! We won the war. The whole war's over, and we thought we'd have to wait till we grew up to fight in it, and it was us fighting it all the time. I mean, Ender, we're little kids. I'm a little kid, anyway." Bean laughed and Ender smiled. Then they were silent for a little while, Bean sitting on the edge of the bed, and Ender watching him out of half-closed eyes.

Finally Bean thought of something else to say.

"What will we do now that the war's over?" he said.

Ender closed his eyes and said, "I need some sleep, Bean."

Bean got up and left and Ender slept.

Graff and Anderson walked through the gates into the park. There was a breeze, but the sun was hot on their shoulders.

"Abba Technics? In the capital?" Graff asked.

"No, in Biggock County. Training division," Anderson replied. "They think my work with children is good preparation. And you?"

Graff smiled and shook his head. "No plans. I'll be here for a few more months. Reports, winding down. I've had offers. Personnel development for DCIA, executive vice-president for U and P, but I said no. Publisher wants me to do memoirs of the war. I don't know."

They sat on a bench and watched leaves shivering in the breeze. Children on the monkey bars were laughing and yelling, but the wind and the distance swallowed their words. "Look," Graff said, pointing. A little boy jumped from the bars and ran near the bench where the two men sat. Another boy followed him, and holding his hands like a gun he made an explosive sound. The child he was shooting at didn't stop. He fired again.

"I got you! Come back here!"

The other little boy ran on out of sight.

"Don't you know when you're dead?" The boy shoved his hands in his pockets and kicked a rock back to the monkey bars. Anderson smiled and shook his head. "Kids," he said. Then he and Graff stood up and walked on out of the park. ■

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NOTES TO A SCIENCE FICTION WRITER

BEN BOVA

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Rotating Cylinders and the Possibility of Global Causality Violation

You might be able to
stop the world,
but you can't get off.

Larry Niven

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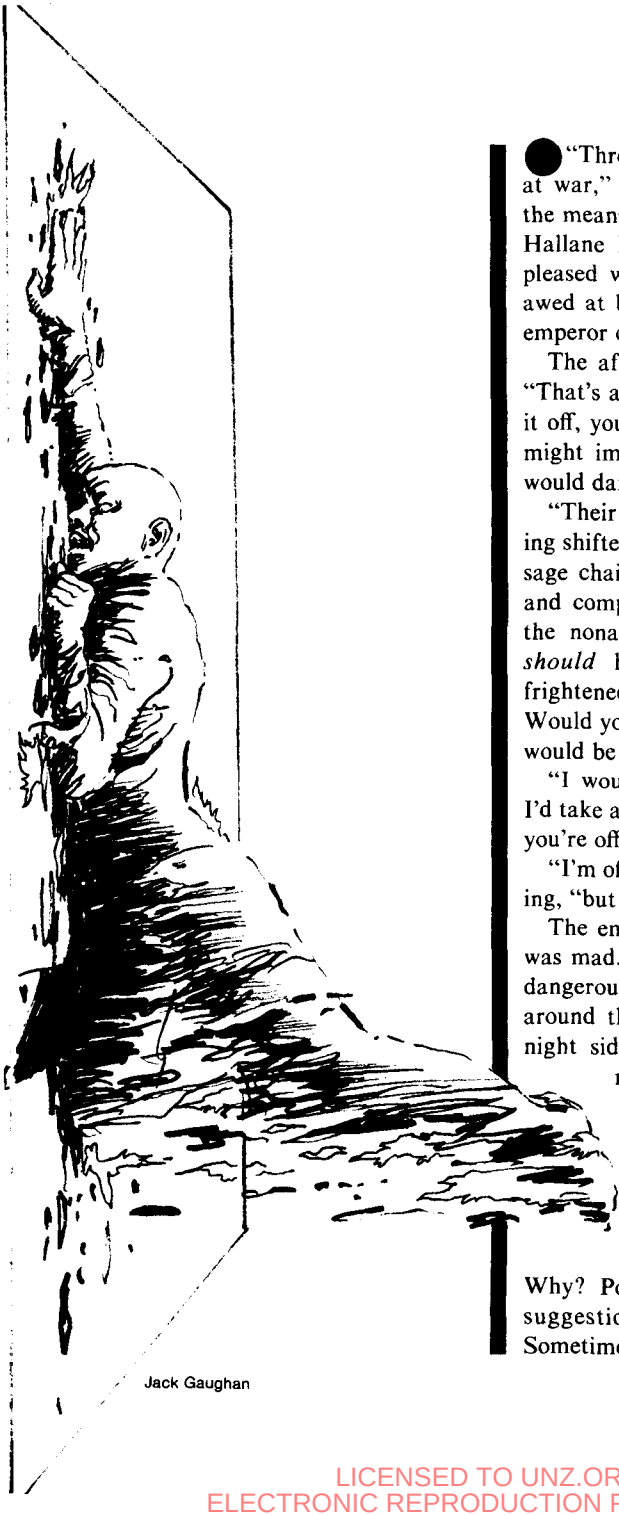

Jack Gaughan

"Three hundred years we've been at war," said Quifting, "and I have the means to end it. I can destroy the Hallane Regency." He seemed very pleased with himself, and not at all awed at being in the presence of the emperor of seventy worlds.

The aforementioned emperor said, "That's a neat trick. If you can't pull it off, you can guess what penalties I might impose. None of my generals would dare such a brag."

"Their tools are not mine." Quifting shifted in a valuable antique massage chair. He was small and round and completely hairless: the style of the nonaristocratic professional. He *should* have been overawed, and frightened. "I'm a mathematician. Would you agree that a time machine would be a useful weapon of war?"

"I would," said the emperor. "Or I'd take a faster-than-light starship, if you're offering miracles."

"I'm offering miracles," said Quifting, "but to the enemy."

The emperor wondered if Quifting was mad. Mad or not, he was hardly dangerous. The emperor was halfway around the planet from him, on the night side. His side of the meeting room was only a holographic projection, though Quifting wouldn't know that.

Half a dozen clerks and couriers had allowed this man to reach the emperor's ersatz presence. Why? Possibly Quifting had useful suggestions, but not necessarily. Sometimes they let an entertaining

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madman through, lest the emperor grow bored.

"It's a very old idea," Quifting said earnestly. "I've traced it back three thousand years, to the era when spaceflight itself was only a dream. I can demonstrate that a massive rotating cylinder, infinite in length, can be circled by closed timelike paths. It seems reasonable that a long but finite—"

"Wait. I must have missed something."

"Take a massive cylinder," Quifting said patiently, "and put a rapid spin on it. I can plot a course for a spacecraft that will bring it around the cylinder and back to its starting point in space *and time*."

"Ah. A functioning time machine, then. Done with relativity, I expect. But must the cylinder be infinitely long?"

"I wouldn't think so. A long but finite cylinder ought to show the same behavior, except near the endpoints."

"And when you say you can demonstrate this . . ."

"To another mathematician. Otherwise I would not have been allowed to meet Your Splendor. In addition, there are historical reasons to think that the cylinder need not be infinite."

Now the emperor was jolted. "Historical? Really?"

"That's surprising, isn't it? But it's easy to design such a time machine, given the Terching Effect. You know about the Terching Effect?"

"It's what makes a warship's hull so rigid," confirmed the emperor.

"Yes. The cylinder must be very strong to take the rotation without flying apart. Of course it would be enormously expensive to build. But others have tried it. The Six Worlds Alliance started one during the Free Trade period."

"Really?"

"We have the records. Archeology had them fifty years ago, but they had no idea what the construct was intended to do. Idiots." Quifting's scowl was brief. "Never mind. A thousand years later, during the One Race Wars, the Mao Buddhists started to build such a time machine out in Sol's cometary halo. Again, behind the Coal Sack is a long, massive cylinder, a quasi-Terching-Effect shell enclosing a neutronium core. We think an alien race called the Kchipreesee built it. The ends are flared, possibly to compensate for edge effects, and there are fusion rocket motors in orbit around it, ready for attachment to spin it up to speed."

"Did nobody ever finish one of these, ah, time machines?"

Quifting pounced on the word. "Nobody!" and he leaned forward, grinning savagely at the emperor. No, he was not awed. A mathematician rules his empire absolutely, and it is more predictable, easier to manipulate, than any universe an emperor would dare believe in. "The Six Worlds Alliance fell apart before their project was barely started. The Mao Buddhist attempt—well, you know what happened to Sol system

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during the One Race Wars. As for the Kchipreesee, I'm told that many generations of space travel killed them off through biorhythm upset."

"That's ridiculous."

"It may be, but they are certainly extinct, and they certainly left their artifact half-finished."

"I don't understand," the emperor admitted. He was tall, muscular, built like a middleweight boxer. Health was the mark of aristocracy in this age. "You seem to be saying that building a time machine is simple but expensive, that it would handle any number of ships— It would, wouldn't it?"

"Oh, yes."

"—and send them back in time to

● Frank Kelly Freas

"Science fiction is my whole life." Like many writers and less than a handful of artists, science fiction to him is not just a way to make a living. It's a labor of love.

The creator of Alfred E. Neuman and a heavy contributor to Mad *magazine in its early, precedent-setting years, Kelly put that behind him and took off from the hectic pace of a free-lance commercial artist in New York City to spend time in Mexico creating his own images—including science fiction illustration. Now living in Virginia, he commutes to New York to discuss assignments with clients.*

His first Analog cover was for the October, 1953 issue, illustrating Tom Godwin's The Gulf Between. *That year, the first Hugos were awarded at the world science fiction convention in Philadelphia. They were skipped in 1954. In 1955 at Cleveland, Kelly received the first of ten Hugos for the year's "Best Artist," five in a row for 1972 through 1976.*

He has been a guest of honor at numerous local science fiction conventions, where he often spends hours turning out portrait sketches for fans. His friends frequently find themselves painted into covers, as do the authors of the stories illustrated. Uniquely, he combines fine art technique with an innate sense of humor to produce always beautiful, sometimes haunting, and often comic otherworldy views. Like his paintings, Kelly Freas is an original.

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exterminate one's enemies' ancestors. Others have tried it. But in practice, the project is always interrupted or abandoned."

"Exactly."

"Why?"

"Do you believe in cause and effect?"

"Of course. I . . . suppose that means I don't believe in time travel, doesn't it?"

"A working time machine would destroy the cause and effect relationship of the universe. It seems the universe resists such meddling. No time machine has ever been put into working condition. If the Hallane Regency tries it something will stop them. The Coal Sack is in Hallane space. They need only attach motors to the Kchipreesee device and spin it up."

"Bringing bad luck down upon their foolish heads. *Hubris.* The pride that challenges the gods. I like it. Yes. Let me see . . ." The emperor generally left war to his generals, but he took a high interest in espionage. He tapped at a pocket computer and said, "Get me Director Chilbreez."

To Quifting he said, "The Director doesn't always arrest enemy spies. Sometimes he just watches 'em. I'll have him pick one and give him a lucky break. Let him stumble on a vital secret, as it were."

"You'd have to back it up—"

"Ah, but we're already trying to recapture Coal Sack space. We'll step up the attacks a little. We should be able to convince the Hallanes that we're trying to take away their time machine. Even if you're completely wrong—which I suspect is true—we'll have them wasting some of their industrial capacity. Maybe start some factional disputes, too. Pro- and anti-time-machine. Hah!" The emperor's smile suddenly left him. "Suppose they actually build a time machine?"

"They won't."

"But a time machine is possible? The mathematics works?"

"But that's the point, Your Splendor. The universe itself resists such things." Quifting smiled confidently. "Don't you believe in cause and effect?"

"Yes."

Violet-white light blazed through the windows behind the mathematician making of him a sharp-edged black shadow. Quifting ran forward and smashed into the holograph wall. His eyes were shut tight, his clothes were afire. "What is it?" he screamed. "What's happening?"

"I imagine the sun has gone nova," said the emperor.

The wall went black.

A dulcet voice spoke. "Director Chilbreez on the line."

"Never mind." There was no point now in telling the director how to get an enemy to build a time machine. The universe protected its cause-and-effect basis with humorless ferocity. Director Chilbreez was doomed; and perhaps Quifting had ended the war after all. The emperor went to the window. A churning aurora blazed bright as day, and grew brighter still. ■

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George Schelling

Competition and aggression are hallmarks of intelligence—along with communication and cooperation.

Skysinger

Allson J. Tellure

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I am Skysinger.

I am Skysinger and I live.

Yes, I continue still, though FirstOne believes me consumed.

FirstOne destroyed my brethren, my friends, my joy; but FirstOne did not destroy me, Skysinger.

I am the Lord of the Upland Lake only, while FirstOne is the Lord of Mother Sea, but I have survived all these countless years in my secret sentinel wisdom, well-hidden from FirstOne's lordly folly, while it churns the empty waves to froth in lonely majesty.

I know what it does not: there exists that which may one day challenge FirstOne's supremacy. It believes itself to be the lord of all the world; but this is not so. There is a whole element of which it swims in near-total ignorance.

The land! The "barren" land!

Long had we known the land bore life: delectable debris came floating down the rivers to us. But so shallow a dimension, so flat a world, we deemed, could never compete with the abundance of the sea, Mother Sea the wide, the fair, the eternal. Few of us speculated on it. Some of the more venturesome, or playful, or bored, traveled far up the rivers, but seldom found ought of great interest. That there could be life on the verges of streams and lakes seemed almost reasonable; but how could beings long survive in the interior without Mother Sea to feed them? And what monstrous form could withstand the fury of the burning sun?

Well, I have seen them. I am one of those who made light-seers with which to please myself with the stars, and one night long, long ago, shortly before FirstOne killed my people, as I floated on the surface of my lake wondering and fancying, I noticed other dim glimmers of colored light, below, on the ground, on the barren ground. Then a flat tympani-membrane, an experiment I had never discarded, though it wasn't as efficient a pressure sensor as my nerve-tendrils, began to vibrate. It thrummed to the disturbance made by beings thrashing through the undergrowth, coming to my lake.

They were three, they were tiny, they flickered and glowed, they were uniform and identical—or so they seemed to me then; I have since learned to distinguish individuals. They were like much larger versions of one of the more primitive beasts of the sea—hard-backed, clawed, many-legged. I know the sea-borne prototype contained a delicious tidbit of meat, so I slid out a feathery arm, hooked it around the nearest and largest of the three, and swept it toward me. I stopped and held it dangling in midair, to admire the brilliant coruscations that now swept over its surface. These were echoed by the two left ashore, which began an unaccountable procedure: they picked up rocks in their four-pronged claws and flung them at me. I stared curiously. I did not at first understand that they meant to damage me: in all my long experience I had never heard of any

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creature damaging one of my kind. We were supreme. Then one rock struck the arm that held the animal; it didn't hurt, but the impact almost caused me to drop it. When another rock rebounded from quite near my eye, I began to comprehend. It amused but amazed me; yet when I tired of this joke and finally dropped the squirming thing into my maw and made one mighty crunch of it, my amazement increased tenfold: there was a brief, indescribable sensation, as of the reception of a communication tissue, but intense, evanescent, alien. I wanted to repeat and identify the experience, but the other two beasts had fled into the night, flashing brightly.

After that I watched the shore with half an eye hastily grown at the end of a long thin pseudopod just for the purpose. I also kept half an ear there: a smaller tympani-membrane.

Over several centuries I caught but half a hundred stragglers and wayfarers—fewer as time went on. Each time I got that tantalizing glimpse, all-too-swiftly melting, of an alien symbology—even, bizarre as it seemed, a landlocked intelligence. Each time it seemed that if only I had the wit to decipher it, I might learn wonders: life on the Land! Each time I seemed to get closer to an instinctive understanding; each time it *almost* had meaning.

One night one of them came to meet me. I watched as it carried an object to the water's edge, placed it carefully upon the surface, and cautiously bestrode it. Curiosity stayed me from snatching it then and there. With its broad claws it paddled straight toward my wonted place in the center of the wide lake.

I rose. We stared at one another, our eyestalks waving and swaying for different vantage angles. It stood up on its floating artifact. It reached out its clawed appendages toward me but made no attempt either to touch, or ward off, or damage me. It gleamed and sparkled at me, colors shivering over its shell.

On an impulse I imprinted a message tissue and squirted it toward the being. Hesitantly it fished it out of the water, watching me the while with one eye as the other bent to its task. Eventually it crammed the greeting into its mouth and chewed. Naturally, it didn't get anything out of it. But even though it did not respond as an intelligent being would have, I could not still the growing certainty that this species was indeed intelligent.

But how could intelligence exist in so small a body? Among my kind it required a great volume of flesh to support the most rudimentary faculties.

I grew impatient with the riddle and plucked the animal from its boat and consumed it.

Again the evanescent taste of almost-communication. But this time I caught a fleeting image: myself, as I must have looked to the shelled creature.

I nearly exploded with joy and

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triumph. For hours I surged to and fro, hilarious with hope, excitement, and vindication. The thing *was* intelligent, and moreover, *it* had been trying to communicate with *me!*

I doubled my watch on the beaches.

Of course, the eyes burned out periodically, and the ears had to be regularly dipped into the water to wash off the airborne detritus that collected on them and ruined their sensitivity. It was during one of these blinded and deafened periods that the body of one of the things was thrown into my lake. I felt the splash, and when upon feeling the object I recognized it as another of my odd little shelled beasties, I crunched it delightedly, eager to repeat the haunting sensation of ingesting communication tissue inscribed with an unknown code.

I spat it out in disgust. The thing was already dead: tasteless. In disappointment I threw the remains back to the shore, where they landed, as I later learned, amid a group of their former feliows.

After that, they brought them to me live.

By the time I reestablished sight and hearing, *they* had established a community within the caverned cliffs not far from my lake. I spent long, absorbed hours observing their fascinating, incomprehensible activities. During the day they hid from the sun in the caves, as I hid in the depths. At night the cliffside scintillated with moving motes of colored light.

Sometimes when they brought me a sacrifice and thrust the bound and struggling thing toward me on a boat, I didn't eat it right away. I peeled it first, dissecting it in an attempt to discover how it worked, and especially, how and why it glowed. The answer is in their nervous systems and shells. Like many of my people, they have extensive nervous systems entwining throughout their bodies, all connected to a central concentrated clot. But among us the thinking process is never so centralized—we tend to concentrate our nervous system for safety and convenience, true, but our brains are still spread throughout our beings. That is why we can change our flesh and not lose intelligence. But these creatures! Why, if one of them were to lose that knob on its thorax where its brain is housed, it would no longer be able to think, to be!

That gave me an idea for an experiment. I did not immediately eat the next victim they gave me. Instead I scooped out a shelf in the rocky wall that shields my lake from the westering sun and deposited my pet there, having first carefully snipped the cords that bound it. I snapped off one of its clawed limbs. Days later, it regenerated. One by one I destroyed each of its sixteen appendages; they all regenerated. All this time I fed it fish and foliage from the lake floor, while it beamed feebly at the audience of its kind that had assembled on the shore to watch this procedure. Then I carefully sliced off the hardcased knob that I know held its brain. As I began it flashed once, strongly, then

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dulled. It collapsed. It would no longer take food, though I carefully left its mouth apparatus undamaged. In a few days the body with its sixteen new limbs began to decompose. My hypothesis was confirmed. Barring major damage to the entire body, only removal of that single lump of brain caused death.

The brain alone tasted of communication tissue. Any image it may have held was wiped out by the sour taste of fear.

It took me longer to learn the glowing mechanism. Half a hundred years passed, 800 experiments, before I knew that glands under their shells secreted substances whose interaction with the shell-material caused it to generate a faint electromagnetic field; that other organs dilating or contracting against thin, pressure-sensitive spots of chitin changed the colors; that the system had originally evolved as one more ingenious weapon in the varied arsenal my world uses for defense from the rapacious sun.

Long before I elucidated the means, however, I had deduced the (biologically secondary, but to me more important) ends: they communicated with one another in light. They had no communication tissue to share, so somehow they had worked out a code of wavelengths, intensities, and rates of repetition. I still remember the huge pride and joy I felt the day this insight came as I meditated on my favorite hobby in my favorite lake-bottom crevice.

I knew now I would never be able to break the code of their clot of message tissue; it had not evolved for that use. If I were going to communicate with them it must be on their own terms. After having researched their light-generating device, I accepted no more sacrifices. Oh, occasionally I would play with a captive, setting it on my shelf and feeding it fish, but as often as not I simply sent it back with no such indulgence in frivolity. Once I even rescued one careless youngling from drowning. (Though their minute ancestors had crawled out of Mother Sea ages ago, they had lost the ability to live in water.)

This abstinence forced a considerable change of diet. I was surprised to realize how dependent I had become on their offerings. I had foolishly neglected the resources of my lake, allowing them to decline.

Thus one night I slithered down the river to the Inland Sea, home of my parent, Hardhead, to exchange greetings and news, and to bathe once more in luxuriant seawater. Old Hardhead was full of gossip, as usual, but had nothing to match my news. It couldn't decide whether it had created an insane offspring or a genius.

Genius, I assured it.

But intelligence stumping around on the land?

Is it not wonderful?

I thought your invention of an eye and discovery of stars outré enough.

It is useful. What is the latest intelligence of old FirstOne?

Do not inject such a taste of contempt into your comments about the

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Lord of the Greater Ocean, you disrespectful young small-one. It is very large, and bears us no love, for it has lived with none but itself all its life. It did us the favor of destroying the bloated one, but it itself is more bloated now, with pride and power. It is dangerous, and it has not spoken to us for thousands of years.

Perhaps it has forgotten about us.

Does one of our kind ever forget anything? No, it waits, it broods—on what, none know. Longfingers has its children patrol the straits continually, with instructions to bring it any message tissue from the Greater Ocean immediately. None have appeared.

Let us speak of something more pleasant. What do you think of my little land-walking sparklers?

I would like to examine one.

I will bring one to you. But please don't eat it; they are, after all, intelligent, and consuming their little bits of message tissue destroys that intelligence. Alas! I have destroyed many! But it was necessary for my education.

So I returned to my lake and waited for a sacrifice. They still came regularly, though I no longer accepted them as food. In fact, more came, unbound, unguarded, unforced. I do not know what good they gained from being set on my ledge and fed fish and returned to the shore; perhaps their community honored them.

But now, for some reason, none appeared for many days. Every night I swam over to the altar/dock they had built and waited, hinting broadly; but they avoided me. I grew frustrated—and hungry.

Five nights after my return, I noticed that the level of water in the lake was rising. Already a film of fluid covered the pier; when I swam waves lapped nearly as high as the shelf I'd carved.

They had dammed the river.

They were attempting to pen me.

I had left and returned, and they wished to ensure I would not leave again.

Of course, it took but a moment to undermine and punch through the earthworks, but I was angered. I ate three of the workers to underline my point (and appease my hunger). I sped back to the dock and awaited them there, impatiently slapping the stone altar; they scuttled after me as fast as their twelve little legs could carry them. On the way, I noticed, they held a brief free-for-all; the two weakest combatants were flung forward to stumble down the pier to me. I grabbed them and held them high, enjoying myself tremendously while they flashed and writhed. I made as if to devour them. Then I carefully set them on my back and swam downstream once more, taking pains to keep them above water.

When we reached the Inland Sea, Hardhead was waiting. It swam around us as I held my pets high out of the way of splashings; it extruded eyestalks, chemoreceptors, and pseudopods to examine them. It felt and smelled them all over for some time, while they blinked excitedly at one

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another, trying to understand.

Finally it agreed with my conclusions: intelligent, and light-communicators. When I told it they had developed a society, even as we had, it grew most enthusiastic over my discovery. It promised to spread the word among the brethren, and I began the journey homeward.

Now, all this while my little ones had been observing us closely, trading colored comments, as we shot message-tissue back and forth. I am sure they understood they were the subjects of a discussion.

As we left the Sea and entered the mouth of the river, they flashed red thrice in unison. They repeated this signal a few times, pointing toward Hardhead as they did so.

I halted, turned, and swam back toward Hardhead, holding them out toward it. It watched, puzzled, as I stopped some distance away. They blipped red thrice again, and no more. Again I turned homeward, thrilled throughout my being. A beginning had been made! Three red flashes meant either Hardhead or goodbye.

The village had posted a lookout, who beamed a brilliant violet light as it sighted us. I saw the reflection on the white cliff wall. The shell-beings swarmed out to greet us, sparkling and shimmering and clattering to and fro on the stone dock. I put my passengers on the altar; their comrades received them rapturously, as far as I could tell. No hard feelings, then. Surrounded by a glowing circle of awed audience, they immediately commenced to gleam and coruscate the tale of their harrowing adventure. They made no attempt to move away from me; evidently I was considered to be either a part of the audience or an honored guest.

Then one with whom I was familiar, a priest who had presided over many sacrifices, rattled forward and made a long glimmering speech at me, none of which I understood, of course. At its conclusion the whole assembly gleamed violet and departed one by one. Last to leave were my priest and passengers.

The next night a violet reflection on the surface of my lake brought me out to investigate. I found a small crowd gathered on the shore: when I appeared, they ceased their purple call and began a series of elaborate pantomimes. First my priest clacked forward and introduced itself: several many-hued coruscations, including one long purple glow: it identified itself with me. Then my two passengers of the previous night stepped up and did the same; each had incorporated a purple flash and three red sparks into its name. This went on for some time, until I knew the names of, though I could not call, all the dignitaries. Three creatures screwed up their courage and jumped into the lake; I fielded them neatly before they touched the water, returned them, and dove; when I surfaced I brought with me several fish, which the shell-folk ceremoniously ate. Thus established our mutual willingness to serve. Three others stepped up and began miming

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the process of procreation on a clear portion of beach. One laid eggs; the second fertilized them; and the third gathered them up into a cavity in its body. Two more shell-folk brought out a shy and dimly protesting youngster, to show me the end product of that reproductive process.

In my turn I submerged, hastily budded off a few dozen of the mother-kind, and brought them up for inspection, tossing one on the beach, where it immediately died, of course. I tangled the rest together, and extruded a long thin pseudopod one unit thick, so they could observe I was made up of such units. Under the pier I hollowed out a tiny den and deposited my offspring there; I cut steps in the bank leading to the nursery so my new shorebound friends could observe its/their growth from night to night.

On the beach they clustered around the mother-unit I'd discarded, spreading out its nerve tendrils and blinking madly over it.

Dawn paled in the east and we all hurried to our respective homes. Thus ended the first lesson; and thus passed a millennium of joyful learning and discovery.

Now after such happiness began a time of great sorrow for me. One night when I returned to the Inland Sea for a snack I found Hardhead gone. I am eating the poor thing out of house and home, I thought, and it is off mooching somewhere, even as I am.

Then a youngling I hadn't met before powered into the Sea.

Are you Skysinger? I am One-Hand, sent to tell you Hardhead has died! ThreeFaces believes it ate poison from the corpse of Lord Longfingers, for Longfingers too is dead, dead of poison, poison come down from the land! All, all grieve for you, we all sorrow with you for the loss of your parent, our friend. ThreeFaces bids you come with me now to the Lesser Ocean, to meet with all the kindred. There is much to be done.

And it hurried away again.

But I couldn't follow. Numb with grief, I drifted there a nameless time, unable to accept this great loss. When Child had died, none of us had grieved; rather we rejoiced over the removal of such a hazard to our lifestyle. But Hardhead! And clever, humorous Longfingers, our wise teacher and leader! Mother Sea will seem barren indeed without them.

My solitary mourning was shattered when Twice limped hastily into the Sea. Its characteristic symmetry was forever destroyed; a huge chunk of its flesh had been ripped away. The moment it smelled me it spat an incoherent, hysterical message at me:

Soldiers . . . monsters . . . killing, destroying . . . FirstOne had come . . . burst through the reefs . . . coral daggers flying . . . ThreeFaces dead, eaten . . . one face floated past me as I fled. . . .

Order your thoughts! I snapped. Imprint carefully and slowly a detailed account! Now!

Something in the taste of my missive must have sobered it, for it replied

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in a more direct manner:

We were in conclave in the Ocean, singing over Longfingers and Hardhead. OneHand reported it had spoken to you; we understood your wish to grieve alone. Soldiers swam through the straits from the Greater Ocean and sped straight for us. They were smaller than the larger of us, but faster than the fastest of us; encased in armament and designed for murder. Caught by surprise, we made a brief stand behind ThreeFaces; but they were too vicious for us—we panicked and fled, they tearing at us as we swam. But they concentrated on poor lost ThreeFaces, because it was the largest, I suppose. Then FirstOne came, and we knew hope was gone. The last I sensed, FirstOne was gathering some of its slaves into itself and feeding on our slain friends. . . . We are doomed and dead.

Not yet, I answered. Not I. Come.

I shot upstream without waiting for it to follow; I had much to do.

When I reached the lake I slammed the wharf repeatedly until my tiny villagers poured out to see what was the matter. Fortunately twilight had come. When all were assembled I reached out a pseudopod as long as I could stretch it and maintain musculature. Just barely I managed to touch the bole of one of a tall stand of hard-shelled vegetation that grew a short distance from the shore. I wrapped around it and tugged mightily, while my friends watched in puzzlement. Finally several rushed back to their cliff and returned bearing sharp tools carved from the shells of their own dead, and began to help me attack the tough spike. Immediately I left that one and went to the next.

They must somehow have felt my urgency, though they couldn't understand my purpose, for a stack of felled trunks soon grew on the white beach. As soon as I received the first I grasped it and began to peel one end with my beak. When I had it in a reasonable point I showed it to them and indicated the still-increasing pile of great stems. They divided into laboring teams, one to shape the ends and one to continue cutting the things down.

One by one I carried the heavy, sharpened logs to the bottom of the lake, rooting them deep into the bottom mud, aslant, stabbing toward the river entrance.

Now Twice appeared, slowly staggered into my demesne, and halted in astonishment at the bustle. Its communication tissue was very faint:

I had heard you had found sapient land life, but didn't credit it. Do you really communicate with them? What are they doing?

They are indeed intelligent. We communicate only very crudely. They are helping me build a trap for the soldiers of the enemy, though they don't know it yet. If you have the strength to hunt and digest an animal meal, help yourself to my fish but stay out of our way.

We strove all night. I kept the little ones busily at it, refusing them the slightest slackening until dawn. Then

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all hastened wearily home.

I forced Twice to keep watch by day, though it hurt it, with strict orders to call me at the first hint of an approaching wave front from downstream. This was not as cruel as it may seem; while prudence dictated that I set a watch, I deemed it most unlikely that the attack come by day, though the soldiers were armored; the whole habit of our species is nocturnal, though we do not sleep by day as the landdwellers do. My villagers could not brook a day watch, and I needed to conserve my strength for the coming battle, when Twice would be largely useless due to its injury. Therefore I made it day-sentinel.

Twice—does FirstOne know, do you think, that Hardhead is already dead?

Yes. In our naiveté we sent it a message that doubtless gave it much pleasure, before we knew its evil, that both Longfingers and Hardhead were slain.

That poison they consumed—that was FirstOne's of course.

Yes. Much good the knowledge does us now.

We shall see. If the enemy knows the Lord of the Inland Sea has already died, it may not trouble itself about our little corner of Mother Sea until it has—dispatched—the larger and more dangerous of the kindred. This *may* give us enough time.

That day I labored underwater, planting the thick spikes that remained.

As twilight deepened and I surfaced near the pier, I found a group of shellbeings awaiting my will, tools at claw, some already at work sharpening stakes, others still picking their way down from their homes. Those busy with the logs I encouraged; the others I led to the entrance to the river and began to pile what rocks I could reach high on either shore. My friends scattered to help me gather and stack them quickly.

I felt a swelling of fondness for them all; they aided and obeyed me without any conception of the cause of their hard labor.

By the coming of day both picket and avalance were in readiness, and well it was. The attack came on the third night. When shadows had deepened to comfort the burning world, Twice signaled the speeding approach of a powerful wave front. Hastily I grabbed two of my helpers and set them atop the piles of rocks, while I imprinted a command for Twice:

Stay right where you are, hidden behind the boulder. If the first trap fails, or if a second soldier follows, pull down the rocks to dam the lake shut; but only then. The landdwellers will help you when they see what you do. If the soldier catches me, do not dam the lake, for you will only trap yourself. Rather, take my child and flee downriver—from death into death, no doubt, but every last chance must be taken.

Scarcely had he received and digested the missive when the hunter burst into the lake. Though only my size, it far outmatched me in speed

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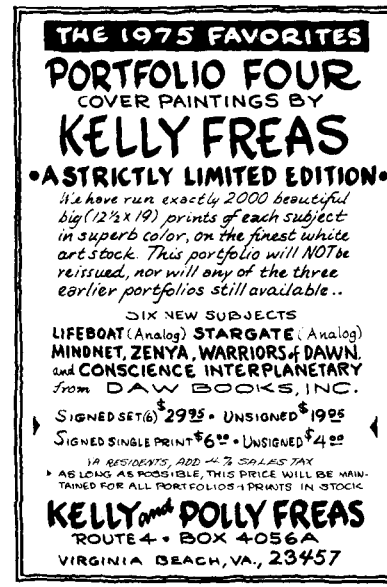
and weaponry; I could only hope I outmatched it in wits. Hovering near the river, I let it sense me as it plowed in; then I turned, dove, and swam my swiftest for the area of stakes. As desperately as I sped, it closed in steadily, an inexorable living engine of destruction bred for efficiency. One stalk-eye looking out for the dangerous spears and one eye trailing behind to monitor my executioner's advance, I fled: it followed ever faster. This speed was all to the good—if it didn't catch me; all depended on its never losing momentum.

With the speed of thought I was at—I was among—the stakes. At the last possible moment I thinned myself, I looped, I spun, I slithered, I swooped—and I managed to miss almost all the spikes, though some tore through a flattened edge of flesh I couldn't fold back in time; I pulled away and left it hanging there.

But the pursuer smashed straight into them. Too late it detected the trap; it failed to pull out of its dive in time.

Pierced in half a hundred places, it hung suspended and writhed, raging at us mutely. FirstOne had not seen fit to teach it to make communication tissue. Armored as it was, it could not easily reshape itself and thus escape. It might have eventually, but it had swum out of time. We dismembered it.

Twice, my child, and I assimilated the shreds, absorbing strength and savagery but no love for FirstOne. I gathered up the hard and sharp parts—shell and sting, claws and tusks, beak and bone—and deposited them on shore for the landdwellers to use as they would.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They had watched the flight—what they could see of it—in total absorption. Their eyestalks still dripped mud and slime. Twice told me not a glimmer did he catch from them until I surfaced in triumph. Then veritable silent explosions, volcanic in intensity, erupted in all colors of the spectrum visible to me. Then one began a violet glow and the others took it up. Applause.

The feast on the soldier's flesh had recuperated much of Twice's resources, so I set it to day watch.

I retired to the depths to experiment with two long lethal pincers I

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had incorporated directly into my body from the still-dying fighter. I was a bit dubious: would they hamper me in threading the spiky maze during the next attack?

For the next would come; of that I had no doubt.

And come it did with the inevitability of dusk. We served the second the same as the first. Again the chase had its audience ashore.

On the eve of the third night since the completion of the dam, I saw a long file of shelled ones marching downstream, skirting the foot of the cliffs that followed the riverbank. I wondered at this to no conclusion as the intermittent series of soft sparkles bobbed away into the darkness.

But there was little time for futile speculation, for Twice soon signaled the advent of another invader. Then I learned the landdwellers' intent: a yellow flash jumped from point to point upstream until the warning reached the villager stationed at the lake exit atop the rockpile, who turned and flashed out over the lake an insistent yellow cry. Twice had alerted me first, but I appreciated their thought.

The third monster, larger than the former two, came also more warily. It perceived me and gave chase as I zipped away, but it also sensed Twice's presence and in keeping watch on us both it slowed enough to detect the trap in time to veer. Three stakes snagged its powerful propulsive tail, but with one mighty tug it ripped away and came up fighting. This major damage severely curtailed its mobility; now it could only hover in midlake; but it remained a formidable, fearsome foe and I required all of Twice's aid to feint and divert its fury while I darted in under its vicious defenses to rip away whatever was vulnerable.

The first two battles had ended in moments; the third still raged as dawn paled the sky. It continued until high noon, when Twice and I could bear the sunlight no longer—our eyes gave us a disadvantage here; we broke off the conflict finally and hid ourselves in the cool caverns in the bottom mud. But the enemy could not flee the sun, the sun more ferocious than even FirstOne's malevolence. Warm currents bore it ever nearer the surface. It sizzled in its shell.

But even after the cliff had flung its protective wing of shadow over my broad lake and we ventured forth once more, the creature yet lived and offered us a feeble defiance. We gave it a mercy undeserved and finished it quickly.

Twice, exhausted, returned to its cave.

Much of the soldier was already in fragments; I completed the shredding and brought the most easily assimilable tidbits to Twice; and again gave my friends such portions as I thought they might desire. My offspring and I shared the remainder.

We had but few hours before the next ordeal. How long would this struggle continue? Was FirstOne's spite undying? How fared our kindred?

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Twice could not mount guard. It lay ill and dying in its hole, twice attempting to rise to the burden I'd laid on it. I gave it what care and comfort I could and went to its post myself. But I was groggy and distraught and my attention must have wandered, for without the yellow alert lights of my landbound comrades the enemy would have taken me unawares. I did not understand how the ones who had gone down the river the night before had managed to survive the day, but I knew none had gone anew this evening; perhaps they had carved out shelters in the rock wall. Their courage saved my life.

The fourth assassin was yet greater, yet more menacing, than the last. It never slowed but made straight for me. It caught me just before the stakes and tore out an appropriated appendage. This so imbalanced me I tumbled heavily into the shafts, fortunately not the points, of the forest of spears of my own sowing. But the soldier also crashed into those spears and on it they worked my will. Three long sharp pincer limbs lay in the roiled mud, completely severed. Its cracked and shivered armor plate stuck out in jagged shards, still attached to but leaving partially vulnerable the tender meat within. But so fiercely did it fend me off while it worked itself free I could not follow up this advantage.

Now each had taken the measure of the other and we circled warily, weaving a pattern of three dimensions, not only horizontally as the landdwellers do. Each had taken hurts but each retained strength and fighting spirit; and in armament, mass, and size we now nearly matched, since I had made good use of its fellows.

As we broke the surface of the water the shoreline shone with rippling color in which purple dominated. I allowed one eyeball one brief glance in that direction—airbreathers lined the lake, armed with slender, miniature versions of the stakes I'd planted, weapons tipped with shell and bone, claw and beak ripped from the defeated attackers.

I'd long ago lost hope; only a grim, irrational determination remained to fight to the bitter, ineluctable end, to destroy as many of the enemy's minions as I could before they destroyed me. Now from the boiling glare of my impending death came the cool darkness of hope rehatched.

Cautiously I circled ever nearer to the sloping shallows; the brute followed. Slowly, slowly I led and herded it toward land and my waiting allies, on tenterhooks lest it detect them too soon—until I remembered it had no eyes and its pressure-sensors would not work out of water.

As the distance between us and the beach narrowed so did that between it and me. Its longer reach nearly proved my defeat. Suddenly it shot out two wicked claws and gripped my beak to rend it open. Strictly by ill chance one of them tore out my body-eye. Agony such as I had never known flooded me. Only those members of my species who had already died at FirstOne's

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will could possibly have experienced such pain, and even they perhaps did not, not even in the last moments before total dissolution. As a species we had never gone in much for pain nerves as warning systems against danger; but it was necessary for me to know precisely when daylight began to be too strong for my newly-invented eye. Thus I was vulnerable through my sight. I had never experienced distress such as this; I couldn't deal with it; I had no instinctive mechanism for suffering; I wanted only to die and end the torment.

All will to resist abandoned me. Pain subsumed reason. I was helpless, I was doomed, I was dying, I was dead—

Not yet. Not I.

Unaccountably the enemy did not close in for the kill, did not take advantage of my agonized weakness.

When again I could concentrate enough to focus my remaining eyes, I was the reason for its miraculous stillness: it bristled with the hafts of my friends' crude weapons. I had led it close enough to them after all.

Beached and dying, it still fought on. Three of the landdwellers lay unmoving in the shallows. But now, jubilantly, with renewed will, I moved in on the monster, and with the able distracting assistance of the little ones, succeeded in ripping it apart.

But I had no respite. An agitation from Twice's direction drew my attention to the repeated yellow danger sign. I limped, spasming with pain, to the strait, but Twice blocked me.

Move! You minuscule fool!

No. I am dying. I cannot recover. Why should both of us be lost?

And long before I had completed digesting this query, it had dashed off for the precariously-piled embankment.

The creatures watching atop the mounds anticipated its intent and began throwing down the prepared dams. Twice pulled supporting boulders out from underneath and the rocks cascaded into the lake exit.

Too late—the fifth soldier of First-One followed too closely on its comrade's tail. The avalanche slowed and battered it but could not long stay it. It scoured through, groping blindly for a victim, its pressure-wave sensors disrupted by the churning turbulence of the failed dam.

But it could still smell Twice, of course. Before I could react it sliced my valiant friend neatly in two, and proceeded to gobble the shuddering remains.

Weakened as I was, I could never hope to defeat so devastating a hunter as that last one was. My only tenuous chance for a few more moments' survival was to hold myself absolutely still in the water, and hope no scent of me washed to it. But that hope was vain. As it polished Twice off, it twitched and reared, chemoreceptor-specialized organ extended to its fullest. Slowly it swam toward me, pincers spread.

I fled. Blindly I dashed away from it, my headlong course accidentally taking me to the stone pier on the

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beach—to my progeny—

To the creche.

I skimmed around that rocky obstacle, panicked, despaired, throbbed with pain from the blinded eye, and cast my mind about for a possible defensible hiding place.

But I was pursued no longer. When I finally dared to look back, I saw the monster I'd led to the nursery consuming my child.

I floated motionless behind the dock, my eyestalks erected over it to observe the murderer. It, of course, had no eyes, and thus could not see mine.

It finished its vile meal and swam in a circle, questing. This time it failed to sense me. I believe the fact that I lay in the shallows, partially shielded by roiled mud, saved me, as well as the fact that, although it had found two where it had expected only one, it was too stupid to imagine the possibility of three.

Finally, finally, after wreaking so much havoc and sorrow, it departed downstream.

None have returned since. Seldom have the yellow lights reported the presence of FirstOne or his toys even in the Inland Sea. But I do not forget.

I spend these centuries growing in wisdom and power, teaching the little ones the secrets of our world, preparing that race for its mission. For the night will come when they will venture forth with me on mighty barks, and harry from Mother Sea that evil, that unspeakable, that essence of the loathesomeness and corruption that FirstOne of my kind. Thus I will, thus I command, thus let it be. ■

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Throughout my life at sea I have been known as a cargo man. This does not mean I dislike the cruise trade. An old yarn-spinning bastard like me can always use a captive audience.

However, during the years when I was coming up in the officer ranks I did not have the background or education for more than the rustbucket jobs the Company gave me. To compensate, I suppose, I made myself an expert on cargoes and on the tough jobs a better-educated man would not have had to accept.

So I did not know what to make of it when Mickleberry in Operations ordered me off a container ship, then transiting the Panama Canal, and pulled me back to New York to sign on as relief skipper of *Ocean Wanderer,* the Company's newest cruise vessel.

I was tired from three days of bad weather and the jet trip home, and I sat in Mickleberry's office as if I would need a derrick to get me out of the chair.

I was miffed, too, having sat in the same chair the year before and warned Mickleberry that the *Wanderer* was headed for the rocks with Lover Boy Tressingdale as skipper. Some years previously the guy had sailed as one of my mates. He was clever enough, but he had a slick, apple-polishing manner and the morals of a tomcat.

Mickleberry had brushed my warnings aside. He said Tressingdale was ingratiating, educated, refined—I liked that 'refined', having sailed with

Doug Beekman

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The 4th Stage Polygraph

The first step
in learning a new skill
is *wanting* to learn.

Sam Nicholson

the guy—and his morals were, after all, none of the Company's business.

"A guy who cheats with women can just as easily cheat with Company assets," I told Mickleberry. "Be careful who you put aboard as chief steward with Tressingdale. Ship's stores are highly negotiable in the Third World areas where the *Wanderer* will be cruising."

Mickleberry had not listened. As Tressingdale's chief steward he had chosen another refined gentleman, named Bruner. The kind of alcoholic who tanks up on vodka and imagines nobody will notice his fusel-oil breath, pouchy eyes, or unsteady hands.

And now I had to sit and keep my mouth shut while Mickleberry put his thin fingertips together and explained in his precise voice that *Ocean Wanderer*'s cost sheets were unsatisfactory.

"We have transferred Captain Tressingdale to a less—ah—vulnerable ship, but we have left Steward Bruner aboard pending fuller investigation," he stated.

Even for Mickleberry, this was stupid. I said, "Bruner is a crook. All he'll do for an investigation is bolix it up."

"Bruner is a sea-lawyer who intends to fight to the last ditch for a cushy job. Our legal department wants evidence of criminal guilt, so we can get rid of him, once and for all.

"To assist you, Captain Schuster, we will have aboard as passengers— " he picked up a Xeroxed passenger list from the desk, "—Mr. and Mrs.

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Borg-Cohen. You know, of course, about Borg-Cohen's sensitive work."

I did not know. I raised my eyebrows and Mickleberry explained, "Mr. Borg-Cohen manufactures what are crudely known as lie detectors. The machines actually measure the tell-tale physical reactions—"

"Okay, okay. I know what a lie detector measures."

"Mr. Borg-Cohen extended the basic polygraph to detect the intention of wrong doing and prevent it. That is why he is best known as the Shopping Cart King."

I thought Mickleberry was high as a kite. "Shopping Cart King?"

"He manufactures a supermarket shopping cart with sensors inside the push-bar which detect a guilt reaction from hand pressure—as, for example, from a person intending to push the cart beyond the prescribed area. Upon which, the cart's wheels lock. This single device has saved supermarkets thousands of dollars formerly used for the collection of strayed carts and the replacement of stolen ones."

"What's the customer reaction to the monitoring?"

"Generally favorable. Honest people get fed up with chiselers who increase marketing costs. Mr. Borg-Cohen has employed the same mechanism for industrial tools liable to be borrowed or pilfered by plant employes. The guilt-detecting sensors render the tools inoperable if misappropriated."

"Yeah, but there's all kinds of guilt," I objected. "Suppose a guy is operating an electric drill. He starts to worry whether his wife knows about his girl friend. His hand sweats, the drill freezes and a thousand-dollar hunk of steel has to be scrapped."

Mickleberry pyramided his fingers again. "That is why I called Mr. Borg-Cohen's work sensitive. His sensors can distinguish between personal-emotional guilt and offenses-against-property guilt. His mechanisms can stop a man from stealing a lawn mower—but not from killing his wife."

"What's this got to do with nailing Bruner?"

"Mr. Borg-Cohen, taking the basic polygraph a step farther, has developed an inhibitor. When the subject steps through a frame like that of an airport metal-detector, his guilt intention can be measured and, if necessary, blocked out."

"Remote control lobotomy?"

Mickleberry pursed his mouth. "I would not say so, no. It is a specifically limited barrier. It brainwashes only as a padlock brainwashes a thief away from a door."

He paused and added, "Steward Bruner's troublemaking can, we hope, be nullified by the installation of the inhibitor."

Oh Jeez, I thought. I asked, "When do I go aboard?"

"A car is waiting to take you to the pier. Is your suitcase in the outer office? Good."

I hauled myself to my feet. Mickleberry said dryly, "Remember, captain, your cargo is passengers, not

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containers. Captain Tressingdale was, despite his faults, a charming, popular man. Try to emulate those traits. If possible."

I could have busted him one and quit, but I knew he had been pressured by the top brass into putting me aboard. It kinda amused me to irritate his ulcers.

Ocean Wanderer was a sleek, compact cruise ship, but as soon as the car dropped me at the pier I could see the result of the Tressingdale-Bruner ripoffs. The rust on the ship's hull had been dabbed at, not painted. Rust streaks on the upper deckhouse also showed poor maintenance.

I knew the chief mate, a solid competent man named Alcott. I did not hold him responsible for the neglect. Tressingdale had tried to balance the milking of the steward's department by cutting down on the deck expenses.

I grabbed my suitcase, dodged the forklift trucks and started aboard. I got no farther than the top of the gangway, which was half blocked by gray metal cases stamped FRAGILE—TEMPERATURE-SENSITIVE APPARATUS—THIS SIDE UP.

The junior third mate was coping pokerfaced with a man and a woman standing beside the cases. My first thought was that they were a genuinely nice middle-aged couple.

The man was a wiry type who had rounded somewhat as life had slowed him down, but he was still in good trim. He had a mop of iron-gray hair, bright gray eyes and a ruddy, peppy-looking face. His clothes were lived-in but of good quality, as if a tailor got a chance to work on him now and then.

The woman was an old-fashioned, real woman. Her own graying hair was braided around her head. Her face was plump and relaxed, with a good, soap-washed complexion and clear hazel eyes. Her clothes had quiet style. I thought, there's a lady.

The watch officer saw me and said, "Captain Schuster—Mr. and Mrs. Borg-Cohen. There's been a misunderstanding about—"

The couple looked at me, and I could see myself in their surprised glances—travel-rumpled, unshaven, probably smelling like a goat. I set down the suitcase and shook hands with them, reflecting that Tressingdale would have been more charming.

Borg-Cohen said to me, "Mr. Mickleberry assured me, captain, that my equipment could be stored in a room with temperature control, but this officer—"

I had not bothered to argue with Mickleberry, but my first resolve had been to throw Borg-Cohen and his spy machine off the ship. Now the job did not seem so agreeable. I said to him, "Come up to my quarters—you and your wife—so we can figure this deal out."

The officer spoke up, "Mr. Alcott has been called ashore, sir, but he left the keys to your quarters with me."

He took the keys from his pocket,

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and I accepted them without comment, although Alcott should not have handed them off. He could not have taken them ashore either, of course. Under Mickleberry's coaching, the team never knew who was carrying the ball.

I grabbed the suitcase again and led the Borg-Cohens through the alleyways. The damned floating hotel was as unfamiliar to me as it was to them.

The skipper's quarters were aft of the bridge. I latchkeyed my way into the dayroom and stopped as if I was an intruder.

The quarters were clean and shipshape, but Tressingdale was still in the atmosphere. The dayroom stank of hair oil, scented cigarettes, and women's perfume.

I waved my guests ahead of me. "Sit down and take the weight off your feet."

They smiled at each other and moved to the settee. I lumbered after them.

"What would you like to drink?" I went on, opening a bar cabinet that lit up like a pinball machine and ruined what little was left of my ingratiating manner.

Mrs. Borg-Cohen began to laugh—a nice understanding laugh.

"Too much has happened too fast, captain, yes?" she said in her warm voice. "It should be Captain Tressingdale here, and you have had to substitute in a hurry. The plane trip you are feeling yet, with maybe tiredness before that. I see by your eyes you have not slept. Now don't worry about Poppa and me. Take a good shower and feel better before you worry about Poppa's inhibitor."

"That's the most sensible talk I've heard all day," I told her.

I telephoned the messman to bring us a tray of coffee, picked up the suitcase and dived into the bedroom. I showered, scraped my face and pulled on a uniform instead of the khakis I usually slopped around in.

When I came back to the dayroom I felt more like myself. The tray was on the table in front of the settee. I sat down, accepted a cup of coffee from Mrs. Borg-Cohen and explained as tactfully as I could, "The trouble with shipping companies is that they are run by bankers and accountants who never try to learn about the sea.

"Mr. Borg-Cohen, I can understand why your machines go over big in supermarkets or industrial plants, but the seafaring unions would never in a million years tolerate that kind of monitoring.

"Why, if the crew realized what your boxes contain, I would have a mutiny on my hands. Regardless of what those front office dummies cooked up, I can't allow you to operate any polygraph machine on board."

Mr. Borg-Cohen rubbed his unruly mop of hair and gave me a shrewd look. "You, personally, do not want the inhibitor on board."

"Frankly, I do not. A robot has no place in a ship's chain of command. Only human judgment is flexible

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enough to react to sea conditions. A master who cannot size up and get rid of a crooked officer has no business commanding a ship."

Mr. Borg-Cohen turned to his wife. "So, Momma, we can take the inhibitor and go home."

She was struggling not to let the tears spill out of her eyes. It was easy to guess that this cancelled cruise was only the latest in a long line of similar disappointments. I said quickly, "Stay aboard, Mr. Borg-Cohen. The Company wasted your time. They owe you and your wife a cruise."

His wife pleaded, "You made the arrangements already, to take the time, Poppa."

He smiled and patted her knee. "Well, all right. A cruise could maybe be interesting."

He glanced around—at the bar cabinet still lit up like a pinball machine, and at my ugly mug. Something seemed to strike him funny. He repeated, "Interesting," and the couple got to their feet.

I rose also and said, "I don't know what air-conditioned stowage space may be available, but temporarily we can stow the inhibitor in the pilot's cabin on this deck. The ship won't be using—"

I stopped and muttered, "Oh, cripes."

They looked at me. I explained, "You won't believe this, but I don't know where the hell this cruise is supposed to go. I never asked."

Well, they leaned against each other and howled. Finally Mr. Borg-Cohen took a bright-colored folder from his pocket.

"In case you don't find out, I give you the cruise brochure," he said.

I thanked him, and they left. I glanced at the Azores-Casablanca-Maderia-Canaries-St. Thomas itinerary, chortling to myself. I shut the bar cabinet, shifted my coffee cup to the desk and telephoned the orders about Borg-Cohen's boxes.

As I sat down behind the mess of sailing papers on the desk, I heard a knock at the opened dayroom door. It was Chief Steward Bruner with a passenger list in his hand.

Bruner was heavier and yet more drawn than the last time I had seen him, as if the vodka had sagged to his belly and pulled his jaw muscles down with it. He said sourly, "When Tressingdale was axed I might have known Schuster would be put aboard to go through the ship."

"Like a dose of salts, Bruner."

"You don't scare me. Your loud mouth won't last a week on a luxury cruise. When the passengers start complaining, your head will follow Tressingdale's."

"Don't bet on it. If that's all you have to say, get out."

He flapped the passenger list at me. "Who do you want at your table?"

"The Borg-Cohens. Otherwise I don't care."

Female voices yapped shrilly in the alleyway, and a pair of bewigged, bedaubed, pantsuited dames hove into view. They hailed Bruner like an old pal, but their mouths fell open when

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they saw me behind the desk.

"Who are you? A relief skipper?" demanded one the them, round-eyed under sticky lashes. "Well, of all the nerve! The passenger agent promised us Tressingdale!"

It was a tough broadside to meet, even if I had been braced for it, which I was not. While I was forming and deleting a comeback, Bruner slid an arm around each female and eased the pair into the alleyway. Before the voices faded out I could hear Bruner telling them, "Steer clear of Schuster. He opens bottles with his teeth and eats passengers for breakfast."

If I was in a competition for passenger favor, I sure had been left at the post. I hoped eventually to beat out Bruner, but meanwhile I had to get the show on the road.

My luck running true to form, we sailed out the Narrows and into a fogbank. Visibility lengthened as we moved away from the coast, but it was well past the dinner hour before I felt justified in leaving the bridge. The evening being half shot, I decided to spend the rest of it conferring with Chief Engineer Haines and Chief Mate Alcott. I told the watch to locate them, and I went to my quarters.

The two officers arrived a few minutes later. Being old shipmates we had a couple drinks while we chewed the fat, but it was more than a get-together of old buddies. I am not a polygraph lie-detector. To find out if a guy is on the level, I have to sit down opposite him and listen to what he tells me.

The conference satisfied me that Haines and Alcott were as straight and dependable as I had remembered them, and it cleared the decks for my fight with Bruner.

The next morning I decided to open the Bruner offensive at once. I drank my morning coffee on the bridge while I checked with the navigation officer. Then I went below and began my inventory of the steward's department. I did not know how Bruner and Tressingdale had been smuggling the stores off the ship. In phony laundry bags? In emptied crates returned to a crooked ship chandler?

One fact was certain from the audit. They had been running a neat little racket with sacks of American

IN TIMES TO COME A really good writer can make an editor break the rules. One of the unwritteh rules of magazine editing is that you can't use stories that are much longer than 20,000 words, unless they are novels—which you can then serialize in three or more installments. This means good, solid, but lengthy novelettes and novellas are *manuscripta non grata*.

But stories by writers of Keith Laumer's stature are too good to miss, whatever their length. So next month's Analog will feature the first half of his novella, "The Wonderful Secret," which pits a very ordinary (ha!) human being against a very extraordinary alien visitor to Earth. George Schelling has done a beautiful cover painting for the tale.

We'll also have another installment of Stanley Schmidt's "Lifeboat Earth" series, a fascinating science fact article from Dr. Robert Forward, and other goodies.

The July 1977 cover, mistakenly credited to Rick Sternbach, was actually painted by Mike Hinge.

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flour, cases of coffee and canned meat, cartons of cigarettes.

I worked all day inventorying the lockers, storerooms, freezers. I made sure a day-to-day use-record would be kept. Bruner trailed around after me, giving me the needle.

"You can raise hell for one cruise, Schuster," he taunted me. "I can wait. You won't be here for the next."

What he said was true. If he kept his nose clean this voyage how could I get the goods on him?

At the end of a hard day I realized I had to put in an appearance at dinner. I cleaned up and went down there. Late, I admit. The sudden chill in the dining room hit me like a wet fish.

Two VIP couples and an enamel-faced harridan were at my table, in addition to the Borg-Cohens. I said, "Good evening," as I took my chair. I was trying to be high-class, but the words sounded short and unfriendly. I could have skated on the looks I got. A couple of the womenfolk started speaking across me.

"Well! I was wondering if we had a captain! Weren't you?"

"Oh, no. Only the captain could have called Mr. Haines away from seven No Trump, doubled and redoubled."

I thought, *Jeez, I put my foot in it again.* Naturally Chief Haines had come immediately at my summons. For all he knew, the ship could have been going down for the third time. I should have made clear to him and Alcott that it was no Mayday.

Mrs. Borg-Cohen was saying, "A captain must first do his job."

"My dear, the passengers are his job! Otherwise he's a figurehead. The officers do all the work. A modern ship runs itself anyhow. Doesn't it, Captain Schuster?"

"Why ask me?" I deadpanned. "I've never been to sea before."

"You've never been on a cruise before!" was the crowing answer. "Mr. Bruner says you've always been a cargo man. And when a passenger spends absolutely thousands for a month at sea, he wants more talent than a cargo man!"

I almost told her to get out and walk, but Mr. Borg-Cohen's clear eyes were begging me to keep it cool. I said heartily, "The Red Sox look pretty good in training, don't they?"

Borg-Cohen fielded this ball, and the dinner proceeded without mayhem.

After dinner I said to hell with the cruise entertainment and went to my quarters. I unbuttoned my collar, poured myself a scotch and wondered if I could learn the cruise technique soon enough. Bruner obviously had sold the passengers a bill of goods on my incompetence. I meant well, but I certainly had started out on two left feet.

The telephone rang. It was Borg-Cohen. "Captain, if you have five minutes—"

"Sure. Come on up."

He came promptly, opted for bourbon and ginger ale and faced me across the dayroom table. He began,

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"Captain, you do not know what it is like to be a mad scientist."

I had to smile as I agreed that mad scientists were a closed book to me.

"It is always, one invention has to follow the next," he went on. "From the basic polygraph comes the shopping cart. From the cart, the inhibitor. From the inhibitor, a fourth stage. You see how they are all stages of the same thing?"

I hesitated, and he spoke more slowly, tracing invisible diagrams on the table. "The polygraph measures if a person is comfortable with what he is saying. Is his discomfort embarrassment or guilt? If guilt, what kind? High-peak love-hate guilt? Or low-tremor sneak-and-snitch guilt? You follow?"

I nodded and he continued, "The second stage is to use the guilt to trigger a mechanism. An industrial worker thinks, 'I will steal this power tool. The insurance company pays.' But the low-tremor guilt is in his touch. The mechanism is released, and the power is cut off.

"For the third stage the guilt does not trigger another mechanism. It is turned back against the person and cancels his impulse to act. Cancels only that impulse. As, for example, the sight of an armed policeman might cancel out a thief's impulse to snatch a purse."

"Or might not."

"True. Human motives are complex. A thief might very well kill a policeman because hate or vengeance overrode the desire to steal. The inhibitor cancels only property-guilt impulses.

"But we will forget the inhibitor. I came tonight to tell you that a fourth stage is nagging to get out of my mad brain. By chance, I can experiment with it on board because I brought along extra modifiers for the inhibitor. I hope I can work while Momma cruises."

"As long as the experiment does not distort the readings of the ship's instruments, you can work as much as you please. Do you need work space?"

"The pilot's cabin is sufficient. But I need a subject. For only twenty seconds a day. Would you be so kind, captain? Look, I set up the frame right here, in front of your bedroom door. Twice a day as you pass through the frame you put your hand on a metal plate and count to ten. Couldn't you do so much?"

I considered. If I refused he might buttonhole a crewman and land the Company in trouble with the union. I said, "Okay, I'll do it. Is the frame the whole works?"

"I would like a sensor in the main lounge—very small, like a thermostat."

"What's this fourth stage all about?"

He shook his head. "The guinea pig must never be told. The knowledge could affect his reactions. May I set up the frame tomorrow?"

I thought it over. "All right. I'll have to pay an electrician full wages while you work, but you can settle the

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bill with the Company."

"Of course." He finished his drink and stood up. "I have now a request from Momma. You could maybe come and play bridge? Momma would like a partner who is not such a mad genius that counting trump is beneath him."

I laughed. Momma knew I had made a mistake, walking out on the entertainment. I downed the scotch, rebuttoned my collar and said, "I haven't played bridge since Culbertson was a pup, but I can finesse with the best of 'em."

The card game broke the ice just fine. I still was not Tressingdale, but I was learning the ropes.

The next morning after breakfast Borg-Cohen began setting up the frame for the new machine. The standby electrician became the nucleus for a group of kibitzing officers who came and went as the watches changed. I encouraged this open curiosity. I did not want the crew to think I was trying to put something over on them.

In the afternoon I asked Chief Haines for his opinion about the fourth-stage purpose. He said slowly, "It sounds crazy, but I believe the lounge sensor is taking a subvocal Gallup poll and feeding the information to a small computer in the pilot's cabin, which in turn sends the information to the frame. I can see a pattern of intake-analysis-output. But intake of what, or output of what, is beyond me."

Shortly before dinner Borg-Cohen finished assembling the gadget, and everybody cleared out. Feeling kinda foolish, I stepped into the frame, put my hand on the plate and counted ten seconds.

Nothing happened. I passed through to the bedroom, gussied myself up and beat it to the dining room.

I reflected that we had a real friendly crowd this voyage. As I sat down I said, "Hello, folks. You can blame Mr. Borg-Cohen if I'm late. Now I'm a guinea pig as well as a figurehead."

It got a laugh. Bruner was pussyfooting among the tables, and I saw him staring at me as if there was something he did not understand. I figured I could forget about Bruner, now that I was really beginning to hit my stride.

I do not remember too much about the first part of the cruise, except that we had perfect weather and I was seldom on the bridge. I checked at noon and midnight, but otherwise I left the running of the ship to the officers. She was a good little ship and practically ran herself.

The cruise director reported to me every morning with a list of the day's activities, and I spread myself around as much as I could. My shuffleboard scorched the decks, and by the time we were island-hopping the Azores I was the terror of the dance floor. I always did like that rock beat.

Sometimes I was so busy with social activities that I barely had time for those ten-second pauses in Borg-Cohen's frame.

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The only thing that puzzled me was that Mrs. Borg-Cohen was very quiet and did not seem to be enjoying the cruise. It was a shame, a good-looking woman like that. If she had bought a classy wig and used a little makeup, she would have been the prettiest woman there.

We docked at Casablanca early one sun-drenched morning. The tour buses were, thank God, lined up and waiting at the pier. I had heard that King Hassan was running a tight ship. In Morocco the buses reported on schedule, or else.

My head was none too strong after the previous evening's party. With relief I saw the last mooring line secured and ordered, "Finished with the engine." I went to my office to dispose of the shore brass.

By the time the officials and agents and peddlers had been swept out of the corners, the passengers had disembarked for the day's tour and I had the ship to myself.

Not to myself. I heard a light knock at the opened dayroom door, and one of my dancing partners sauntered in. Claudia, or maybe Sylvia. A swinger but cute.

"Stop slaving over a hot ship, captain," she smiled. "Come ashore. Take me to the Casbah—if this cement oasis has a Casbah."

"If it hasn't, we'll build one," I smiled back. "Wait'll I change into my shore duds."

There was no harm, I reflected, in a shore trip with a cute girl. It was not that I was dumb enough to go overboard about women, like Tressingdale. I walked through the frame, absently resting my hand on the plate.

A shock jarred me to my back teeth, and I jumped back. The frame panel split open and sprayed tiny particles over the carpet.

For a moment I was completely disoriented. I could not figure out what I was doing or why I had that cheap hustler in my room.

The girl looked at my face, gave a yip and ran out.

Borg-Cohen. I had to talk to Borg-Cohen. But he was probably on the shore tour.

Wait a minute. Would a nice, middle-aged Jewish couple be touring an Arab country?

I telephoned their stateroom. No answer. I telephoned the watch officer, "Find Borg-Cohen and send him here pronto."

My knees were still numb from the shock. I folded onto the settee and wondered how I would feel after the numbness wore off.

Mr. and Mrs. Borg-Cohen came into the dayroom. They paused when they saw the broken frame. Mrs. Borg-Cohen said to her husband, "So! It happened, just what I told you!"

I said gruffly, "Never mind, Momma. I won't keelhaul him."

"You are you again! I am so glad!" She burst into tears.

They sat down. I asked Borg-Cohen, "What was the fourth stage?"

"An on-the-job training machine."

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His face was paler and not so peppy. "As you maybe have read, the difficulty in training unskilled workers is not the teaching of the job itself, but fitting an unskilled worker into a sophisticated environment.

"There seems to be a psychic block that is removed only as the worker becomes used to the environment. When the block is removed, he learns quickly. Before it is removed he cannot learn even to throw a switch.

"The on-the-job trainer translates the atmosphere in the shop—and atmosphere is only what emanates from people in their sense-reactions—into impulses which are fed into the subject's nerve centers. He absorbs the atmosphere quickly— the motions of the job come natural to him."

"So you were keying me into the passenger atmosphere?"

"Bruner was out to get you fired. I do not like such slimy crooks. I put a sensor in the main lounge to pick up the pattern of what the passengers expected of a captain, and I set up the frame to make you receptive to those wishes.

"Almost immediately you became more congenial. The life of the party, even. But I forgot two things. The environment consensus had no real understanding of your job. And second, there was a basic ethical conflict. The machine had to break. Even under hypnosis a person cannot be compelled to act against his ethical convictions. Next time I experiment with the trainer—"

"I told Poppa," interrupted Mrs. Borg-Cohen, "you were too nice a man to do what those women wanted you to do. Never could you be so low."

"I'm not sure about that," I teased her. "I was thinking more and more about how you are the prettiest woman aboard."

She laughed and shook her head, and Borg-Cohen said it was lucky for him that the machine blew up when it did, as any woman would prefer a captain to a mad scientist.

After they left I went out on deck to get my numb thoughts working again. I ambled to the bridge wing and looked down at where a ship chandler's truck was unloading seaweed-heaped cases of live lobsters.

Bruner! I thought, my God, I muffed that play completely! Half the voyage gone, and I had forgotten why I had been put aboard.

Bruner was standing alongside the ship, looking over the cases as they came off the truck. He groped a small canvas sack from a mass of weed and threw it back onto the truck. The driver shoved the sack into another case, so fast that it was almost sleight-of-hand. He jumped from the truck and slung the case on top of a pile of other cases waiting to be lifted aboard in a cargo net.

Bruner moved, but he was too late. The net tightened around the cases, and they rose in the air. Bruner clasped his hands nervously as he watched.

Casablanca. A port for the Turkish heroin traffic. A small sack that

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Bruner did not want? Why? Because Tressingdale was not there to hide the sack in the ship's safe? I should have realized that guys who smuggled stores would have no objection to smuggling dope. And now Bruner was finding out the hard way that you do not say No to dope pushers.

What would he do? Find the sack and ditch it? Try to run it into New York? Somebody would be waiting for it. Somebody who would not take excuses.

As I paced the deck a peculiar thing happened. I seemed to hear Bruner say, "Schuster!" and begin cussing. I heard "meat freezer" and I saw a jerky series of mental pictures zero in on a locker of pre-cut and wrapped beef ribs.

I realized that the shock from Borg-Cohen's machine had stripped my brain paths raw. Now that the numbness was wearing off, I was hearing half-vocalized thoughts the way a guy with a hangover hears noises. A ticking clock sounds like a boiler factory.

I waited an hour, my head bursting with voices like Times Square on New Years Eve. I guess I was picking up every subvocal emanation within a sea mile. It killed whatever interest I might have had in telepathy, believe me.

When the torment had ebbed off, I brought Alcott as witness and went below to the main galley, where the cooks were ankle-deep in seaweed and bad-tempered lobsters. Bruner was there, talking to the head chef.

He went pasty white when he saw that Alcott was with me. I said, "Bruner, the heroin is in the meat freezer. With the beef ribs."

His eyes rolled up and he crumpled onto the seaweed. All hell broke loose. The lobsters were strictly sea-to-customer, with unwired claws. They swarmed over Bruner. Alcott and I waded in to haul him free, while the chef shook his fists and hollered at us in French.

I dragged Bruner into the alleyway, found his ring of keys, tossed it to Alcott and told him to bring the contents of the sixth locker—contraband, that is—to my office.

Wanting to deal with Bruner while he was still groggy, I shook some life into him, hoisted him to his feet and propelled him ahead of me.

By the time we got to my quarters his nerve was coming back and he was threatening to sue. In a few minutes Alcott walked in and laid a stiff canvas sack on the desk. His ears, nose and fingers were shiny red from frost. He said reproachfully, "You didn't tell me which end to start counting from, captain."

I pried open the sack. It held small fat plastic bags.

"You can't prove anything," Bruner blustered.

"I don't have to prove anything," I shrugged. "I can just call the Moroccan authorities, tell them how I saw the sack come on board, and let them take you away. I don't know Hassan's punishment for heroin pushers. I understand thieves get their right hands chopped off."

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He went to pieces again. When he was too worn out for more cussing or whining, I said, "I'll make a deal. Resign from the Company. I'll have the Casablanca agent arrange your plane ticket to New York. The heroin goes overboard as soon as we are at sea."

"But you can't continue the cruise without a chief steward!"

"I'll wire Mickleberry tonight. He can fly a new steward to join the ship at Las Palmas. Make up your mind, Bruner. The resignation—or Hassan's cops."

"If you hadn't seen—hadn't guessed where—! They ought to burn you at the stake, you damned mind-reading devil!"

I sat at the desk and typed his resignation. After he had signed it I said to Alcott, "Confine Bruner to his cabin until the agent can take him off the ship."

Alcott dragged him away. I thought, another dirty job done. And this time it was more good luck than good management.

The telephone rang. It was Mrs. Borg-Cohen. "Captain, I was thinking. It is not that these women on cruises are so bad. It is that they are lonely. So very lonely. You will remember—and not get impatient or think ill of them?"

"I'll always remember, Momma."

She said, "Good!" and hung up. I suddenly felt very lonely, myself.

Well, the agent put Bruner on the plane in Morocco, the new chief steward came aboard in Las Palmas, and the voyage circled back to New York without incident.

Naturally I was summoned to Operations to enlarge upon my Voyage Reports. When I was through explaining, Mickleberry put his fingertips together and said, "You have a choice of assigment, captain. You may stay aboard the *Wanderer,* provided you smarten your appearance, tone down you language, and learn a dance step slightly more modern than the Lindy Hop."

"Oh cripes. What's the alternative?"

"You can fly to Baltimore, where *Bulk Trader* is in drydock and needs a skipper to take her out."

"When does the Baltimore plane leave?"

"This evening." He held out an envelope. "The plane ticket—and your bonus check."

"Bonus?" I took the envelope and stood up. "After I scuttled the installation of the Borg-Cohen inhibitor?"

He got his superior expression. "The difficulty with running a shipping company is that the ship personnel are stiff-necked diehards who never try to learn about scientific progress."

I thought, never the twain . . . Mickleberry added, "However, we are pleased that you rid us of Bruner, by whatever methods. One cannot teach an old seadog new tricks."

I let it go at that. I had learned a lot in the cruise, but I was not going to share it with Mickleberry. ■

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the reference library

LESTER DEL REY

AVE ATQUE VALE:

So far as I can determine, only one writer ever managed to span the entire fifty-year history of science fiction. This was Edmond Hamilton, who died on February 1, 1977, at the age of 72. His first story appeared in 1926, and the last writing he did, to the best of my knowledge, was in 1976—just fifty years later.

I met him first in the pages of the fall 1929 *Wonder Quarterly*. And that is so long ago in the way the world has moved that most of today's readers cannot even conceive of the attitude with which I read the story.

Picture a farm boy who had recently moved to a small town in the Middle West. The time was just before the "Great Depression," but already hard times had come to that area, though somehow people always managed to eat. Try to imagine a life where books were still read by kerosene lamps; where water was something carried into the house in a bucket, and where the toilet stood outside with a sometimes icy path to follow. Radio was that wonder some of the neighbors had, airplanes were things one ran out to see go overhead and comic books were still over the horizon. Now picture a fourteen-year-old boy opening the pages of the first science fiction magazine he has ever seen and turning to "The Hidden World" by Edmond Hamilton, with wonders illustrated by Frank R. Paul!

You can't picture it—and to be truthful, I can't really recapture it, either. Oh, I'd read Verne and Wells before, but nothing like this. Here were wonders piled on wonders! And it was Edmond Hamilton who opened the magic casements of science fiction to me, far more than any writer.

During my years of growing up—if I ever really did grow up—I learned to expect such wonders from Hamilton. There were the "Interstellar Patrol" series, where men had colonized other worlds and already formed what I believe was the first interstellar empire in science fiction. There were worlds saved and worlds wrecked. There was "The Cosmic Pantograph" where a universe was created inside a scientist's laboratory—and where the creatures of that microcosmic universe evolved and broke out of their space into the macrocosm beyond. Eventually, there was Captain Future, but I was perhaps too old and sophisticated for him, though he introduced a lot of younger readers to the wonders I had discovered before. And there were the more adult versions of Hamilton's adventure novels: *The Star Kings* and *City at World's End.*

There was another Hamilton, however. He was the artist who turned out occasional shorter stories of excellent craftsmanship and well-controlled mood. And in the sixties, there were two books by that Hamilton that have never received the attention they deserved. One was *The Battle for the*

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Stars, which perhaps began too strongly with crashing suns, but which then quickly settled down to a quietly tense love affair between our Earth and a man who had come home to this ancestral planet from across the galaxy. It's one of my favorite books. And there is *The Haunted Stars,* of a thing found on the Moon and the strange destiny that awaits man beyond the solar system. This was far indeed from the pulp adventure type of fiction.

In time—sometime in the early fifties—I came to know and love the man as well as the writer, though never as much as I might have wished. But our paths crossed at various conventions where he and his wife, Leigh Brackett, appeared. (My God, what a combination of talent!) And as time went on, the meetings grew somewhat more frequent. The last time was at the 1976 Fantasy Convention.

He was a gentleman and an honor to his profession. And he was a friend, whom I and a great many others will sadly miss.

Hail and farewell!

Or fortunately, not quite farewell. The Science Fiction Book Club is just releasing **The Best of Edmond Hamilton,** edited and with an introduction by Leigh Brackett (334 pp., $2.98). This contains twenty-one stories by Hamilton, running from his first story in 1926—"The Monster-God of Mamurth"—to an Afterword, which was written in 1976 and is probably his last professional writing. (There may be one later piece, but I'm uncertain of the time sequence; he also wrote an introduction to a collection of Leigh Brackett's stories which will appear shortly.)

Hamilton is at his best in his shorter fiction, and these selections bear little relation to what the readers of some of his pulp novels might expect. They are quieter stories, done with far more care in most cases than he could expend on most of his longer work. Here the writing is sharp and economical, and the ideas shape the form of the story, rather than being shaped to fit commercial needs.

There is "In the World's Dusk" and "Child of the Winds" from 1936—ten years after Hamilton first began writing, showing how much a man can learn in only one decade. And from 1938, there is "He That Hath Wings," telling of a boy who had to choose between adapting to society by losing his wings or remaining free to ride the winds alone and isolated. I read that when it first appeared and have never read it again; there is no need—it sticks firmly in my memory, undimmed and unforgettable.

And finally, from 1968, there is "Castaway." It isn't easy, as Leigh Brackett indicates in her introduction, to do a good story on assignment, with someone else's subject, and in 3000 words. Even the most experienced professional can stub his toe on such a job. And there are so many obvious things one can do with Edgar Allan Poe! Such obvious invitations to show how well you've studied the subject by going into minutiae about the background and period!

But notice how easily Hamilton slips into the scene, how easily he reveals the character by simple words from the man's mouth. And then reach the last sentence, and see how well he has covered the years to follow by those few simple words.

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The stories are arranged in chronological order, a minor but useful addition to the value of the book.

Thank you, Leigh Brackett, for assembling this memorial volume of the works of one of science fiction's favorite old masters!

Clifford D. Simak has been writing for almost all of the life of category science fiction. His first published story appeared in 1931, and he is still going strong, happily. His latest novel is **A Heritage of Stars** (Berkley/Putnam, c. 182 pp., $7.95). And while that isn't a bad title, I wish they'd left the original title they were going to use: *Place of Going to the Stars*. Ah, well.

This is straight science fiction, with none of the outright fantasy Simak has often mixed into his science fiction lately. Oh, there are some marvelous creatures, but they are aliens this time. I'm glad of that; I like both science fiction and fantasy, but a mixture of the two rarely works.

There are a number of familiar elements here, the type of thing that Simak enjoys best and is very good at doing. We have an Earth that has fallen back from some period of great disaster which destroyed technology. Now men are living more or less like the early men who first struck out across this continent—and some are not unlike the Plains Indians. There is, however, one university left—with books from which all description of technology and the disaster that destroyed it are torn away. But there is a legend of a Place of Going to the Stars—a name and nothing more.

Thomas Cushing, one-time woods runner and now student, sets out to find this place of wonder. With him goes an older woman, Meg—who may or may not be a fake witch. And they meet the last surviving robot; there are plenty of indestructible robot brain cases scattered around, but only Rollo has learned to survive by killing grizzly bears for grease. There are others to form the company. And there are things that follow them or meet them, such as living shadows, a Shivering Snake, moving rocks, and a team of alien observers.

Obviously, they get to the Place of Going to the Stars after a lot of adventures. What they find there isn't what they expected, however. There's a perfectly satisfactory ending to the novel—but I suspect there will be a sequel. I hope so, because there's a lot more to be discovered about all this.

It isn't Simak's best book, but it is a good read. Some of the characters—particularly Meg and Andy the horse—are delightful companions. I'd like to see more of them.

C. J. Cherryh isn't an old master. Her first appearance was with two books in 1976. But they were extremely good books, and the second was even better than the first, which is sort of a rough and ready proof for a writer who will endure. I looked forward with great anticipation to the third book by her.

Now it's here: **Hunter of Worlds** (SF Book Club, 214 pp., $2.49).

Well, it's not a bad book. There's an uncommonly great amount of skill shown in writing a very difficult story and a lot of ingenuity. Behind it all is also a complex and fascinating plot. But I'm sorry to say I'm somewhat disappointed. I think Cherryh has taken a wrong turn off into roads where her talent gets somewhat lost in the

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brambles along the way.

It all takes place off in space, around worlds beyond human settlement originally, then back to an outpost world of mankind. It seems that there is a proud and mighty race too powerful for any other race to oppose. This race is the Iduve, who exist only in their great ships, handing down decrees to other races and taking slaves as they will. (Well-treated slaves, however.)

The Iduve have an elaborate set of feral cultural traditions. Now it seems one member of the race has violated one of their most inviolate traditions and has escaped onto an outpost world of humanity. One Iduve ship, the Ashanome, takes on a member of the Kallia race and a captured human as slaves. These are brain-coupled by a mechanical mind linkage with a slave who had been brought up in the service of the Iduve. It is the job of these three to locate the ritual-breaker.

And from there, it gets complicated. The human is sent to lead a band of quisling humans who begin slaughtering their fellows in a complicated plan to flush out the fugitive. The Kallia is sent down to contact the fugitive. And there is a little human girl who gets adopted by the fugitive, after a fashion.

The trouble is, it's all too damned complicated. In her first two books, Cherryh told her story in pretty straightforward fashion, following a single viewpoint character most of the time. And while her cultures were alien enough, she led us into them so deftly that they became familiar. Even the few important alien words in her second book soon became an easy part of our vocabulary.

Here she jumps around like the mad hatter serving tea at the trial. She really has to, to get all the material in, of course; but that doesn't make it any easier for the reader to follow.

She also has evolved languages—not one, but three—for her aliens, which require glossaries in the back of the book. Now, some of the concepts are fairly hard to get without knowing exactly what the words are, but many aren't necessarily that different; yet for both strange and normal concepts, there are the alien terms striking us on every page. Perhaps a reader can skim through it all and get the general story without looking up words; I found it better to keep turning to the glossary. (I'm willing to memorize a fair number of terms, if they're presented and developed carefully as I go along; but there's a limit before I put the book down and decide to master Greek.)

Maybe I'll like the book better on second reading—if I bother. Even on first reading, there were good spots in plenty. For one thing, the fugitive is a fascinating character. I liked him and wished I could have seen much more of all this from his view; but he was about the only one I really could care about.

As I said, there's a lot of good story buried in the novel, and to pull something like this off at all speaks well for Cherryh's skill. But I wish she'd go back to doing the type of book she can do exceptionally well—a straightforward but rich novel that can be followed without eight pages of vocabularies in the back. I can recommend this only to those willing to work harder at getting the most out of it

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than most readers seem to be.

For those who follow the adventures of Dumarest, #16 of the series is now available: **Haven of Darkness,** by E. C. Tubb (DAW Books, 176 pp., $1.50). This time Dumarest stops on a planet where a strange daily occurence is the seeming presence of specters—ghosts who mix freely with the living. Delusions, of course—but strangely real ones. And the world is divided by night and day; men are free to roam only during the day, with other life taking over at dusk. Rather surprisingly, at the end Dumarest doesn't leave; he stays on with Lavinia, and reasonably so. Apparently he'll be there when #17 begins.

As usual, it's a good tale of adventure, with the character of Dumarest adding considerably to the tale.

For those who like real science, there's **New Guide to the Moon,** by Patrick Moore (Norton, 320 pp., $10.95), who is a recognized expert on the subject. Moore's earlier guide was probably the best general book on the Moon, but I found it a little too absolute on the subject of the volcanic origin of the craters, as opposed to the more general (at least in America) idea of impact origin.

Well, time has proved Moore more accurate than most American astronomers expected. And time and knowledge gained from our flights to the Moon have also modified Moore's stand somewhat. He still considers vulcanism the major influence, apparently. But his presentation takes account of other ideas, and his arguments are presented reasonably and with a wealth of detail and careful reasoning that are a pleasure to read.

I know of no other book that can serve so well to guide the layman across the face and behind the scenes of our satellite as this one. The writing is clear and lucid—and often entertaining. There are enough facts given to delight the most curious or serious reader, and all the various theories are presented reasonably, together with a great deal of interesting historical knowledge about how those theories were developed.

This is an excellent, up-to-date book that should be in the library of anyone interested in astronomy or man's flights into space.

There is also a book for which I have little personal liking, but which I think should be read carefully by a great many people who have been tossing around a lot of the ideas from it for too many years. This is the first paperback edition of Immanuel Velikovsky's **Worlds in Collision** (Pocket Books, 400 pp., $1.95). It's a bargain, and the price should put it within the reach of anyone even remotely interested in all the controversy about it.

Whether for or against the book, anyone who has ever talked about Velikovsky's ideas and hasn't read it carefully should do so now. Then perhaps you can make up your own mind about whether it really prophesied so many things that have come true. Of course, it wouldn't do any harm to find out what was already known or believed by scientists (not science fiction writers) about Venus, and just what the conservation of angular momentum means, and why it has to be.

But in any event here's the book available at most places now, and cheap enough to buy. Get a copy and at least try to read it! ■

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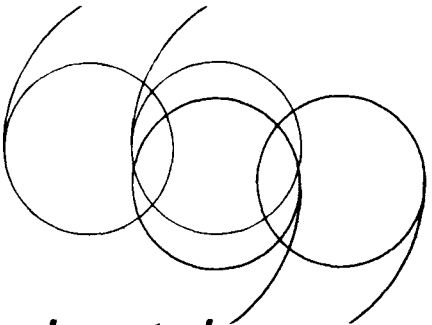

brass tacks

Dear Ben,

I have been doing some work on the Blue Sun phenomenon of 1950, which shows an apparent periodicity (perhaps coincidental, perhaps not) with solar obscurations of 1762 and 1547. I have worked out a possible orbit for the object responsible, assuming the observations *are* connected, and it shows a possible connection with obscurations reported in 936 and 1090, as well as with a very much older account. If I am right, the object should transit the Sun again in August of this year. My attention has just been drawn to a remarkable quotation from Johannes Kepler, with reference to the 1547 event, that such phenomena might be caused by clouds orbiting around the Sun and passing between us and it.

The August 1977 encounter should be a fairly distant one, perhaps visible only through telescopes, showing a thick lens-shaped cloud with a dark nucleus, inclined at right angles to the ecliptic, slowly crossing the Sun's face from east to west. Since we don't know the distance of any of the previous encounters we can't give the exact date, angle subtended, duration or speed of this one—nor the range of latitudes affected, which may be narrow. I would therefore like to ask Analog readers in the northern hemisphere to watch the Sun from say mid-July till September, and let me know at once if they see anything, also trying to get confirmation from other astronomers in their area. Let me however add the standard warning to inexperienced observers *never* to look directly at the Sun through an optical instrument; it's just not worth it when the technique of projection can be learned so easily.

DUNCAN LUNAN
17 Bridgegate (1 up)
Irvine
Ayrshire KA 12 8BJ
Scotland

Here's a chance for Analog's readers to make a contribution to astronomy, and perhaps discover a new member—of an entirely new type!—of our solar system.

Dear Mr. Bova:

I thought your readers might be interested in knowing a nationwide organization dedicated to the study of the works of Mack Reynolds has been formed. This should be of particular interest to Analog readers since for something like a decade Reynolds was one of Analog's most prolific writers.

I think it would be accurate to say possibly half of MR's SF novels originally appeared as Analog serials or novelettes, so no doubt a goodly number of your readers are among his fans. Anyone interested in the group

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and newsletter should write to The Reynolds Circle, C/O Pat Bontempo, P.O. Box 721, Hillside, NJ 07205.

PAT BONTEMPO

P.O. Box 721,
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A prophet is not without honor . . . and Mack Reynolds' newest novel, OF FUTURE FEARS, will begin in our October issue!

Dear Ben,

Editing Analog being a subjective task, we occasionally have to suffer through the most atrocious stories (*cf. Children of Dune*) that you, somehow, liked. I would, however, expect a science fact article to be just that: factual. It is in this context that I object to December's article, "Quantum Physics and Reality."

Talbot and Biggle have committed a sin at once grave and common; they assume that anything physicists do is physics. This is just not so. Outside of their special field physicists are little different from everybody else, (I do not know of any physicist who thinks of sex as being governed by Hooke's Law), and when one philosophizes the result is still philosophy. Physics is concerned with the what, where, when, and how of the universe, philosophy with the why. The two are very close at times, and speculative philosophy will always hold a special appeal for "natural philosophers", but the distinction is always there; when Wagner or Sarfatti speak of wherefors, or of the role of volition in the universe, they are speaking as amateur philosophers and not as professional physicists.

More specifically, on p. 53, they would have us believe:

> [Q]uantum physics provide[s] a speculative scientific basis for . . . the ultrapsychology of extrasensory perception, . . . [and a tentative outline of] the scientific basis for an ultrareligion.

With regard to their claim on ESP, let me point out, again, that metaphysical speculation by a physicist is no more scientific, no more 'physical', than speculation by Billy Graham or Madame Rozaro, the tea-leaf reader. For their religious claim, besides noting that their "scientific basis" is my belly laugh (paraphrasing Lazarus Long's "One man's theology . . ."), let me remind you that, by definition, religion is founded on faith in revelation, while science is founded on faith in observation and induction. In other words, even granting their "scientific basis", they could no more build a viable religion on it than expect me to consider their article "science fact".

JON SHEMITZ

1939 Yale Station
New Haven CT 06520

But the scientist's faith in observation and induction implies certain other faiths, such as the belief that one and one will always equal two. And all new scientific concepts originate as hypotheses that are little more than a hunch looking for evidence.

Dear Ben Bova,

I've been sitting around thinking about "Quantum Physics and Reality". I came up with this unhappy thought:

If "all possible realities exist simultaneously", then there exists at least one reality in which this theory does not hold true. Or, in other words, there exists at least one reality in

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which there are no other realities possible (since we are covering *all* possibilities). Since we must not exist in one of the realities negated by the existence of the reality in which no other reality is possible, we therefore *must exist in the only reality.*

LAURA E. CAMPBELL
216 W. 14th St.
Davis CA 95616

How about this one: "All physicists are liars. I am a physicist. What am I?"

Dear Mr. Bova,

I finished the last installment of *Shadrach in the Furnace* last night. It is definitely Silverberg's best work since *Dying Inside,* and perhaps even better than it. I was overjoyed to find a bona fide "happy ending" at the end of this story, an ingredient that is in short supply in any novel, mainstream or sf. Not, of course, that I advocate fairy-tale endings for all stories—I found the ending to "Media Man" entirely fitting, although I'm absolutely certain that you're going to get letters from jackasses complaining because 1) the hero did not wed/bed/go-off-into-the-sunset with the heroine, 2) as the esteemed Mr. Wagner put it: "'It could go on for a novel." The ending was fine.

Which brings me to the main beef: Mitchell Wagner's letter (Oct. 1976 Analog). I *liked* "A Matter of Pride", and I thought it was the best story (aside from the tremendous *Children of Dune*) in the first two issues. In fact, I read it three times: twice when I first received the February issue (to offset the disappointment of "A Martian Ricorso" since I was really expecting another story of the caliber of "A Martian Odyssey"; the Ricorso turned out to be an Oddity) and once again last month. I disagree with Wagner: I think Mr. O'Donnell went out of his way to keep from being a "Bigot" and the story shows this. Major King used his intellect and brains in a nonphysical (well, maybe physiological) victory over the smug Korean officers. I did not find the Koreans cruel, they were in a way kind; since I would rather be *temporarily* crippled than dead. I don't really think the Koreans were "Stupid", just careless. The relations between the Georgian colonel and the urban black major were of course strained, but at least Colonel Hoefler did not say, "Well, boy, ah reckon we kin fahnd a job fer you cleanin' latrines." And Wagner's final juvenility of telling Mr. O'Donnell to go back to his seat and write it over needs no comment.

Di Fate's cover is as always, excellent. I find his work crisper, and more spacey than Sternbach, Airbrush, & Co., although nothing can match Mr. Sternbach's nebulae . . . As always, I find myself wondering how John Schoenherr manages to achieve his distinctive hazy, color-blended style . . . Finally, I noticed that on the October cover, the edge of Discus cuts off the corner of the "g" in Analog. It's nice to see you (or Mr. Stoltz) isn't just blindly superimposing the logo over whatever happens to be beneath. Incidentally, I prefer Analog's and F&SF's full-cover illustrations to Galaxy/If's and Amazing *et al.*'s little boxes . . .

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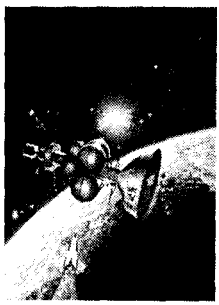

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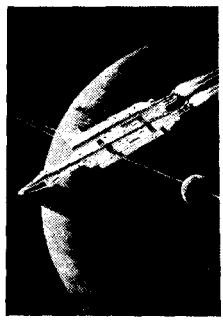

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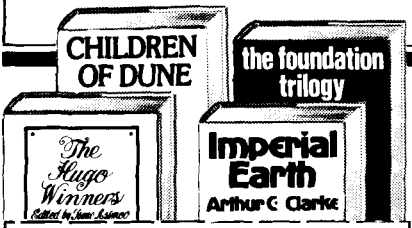

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